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DEFENSE INDUSTRY BULLETIN

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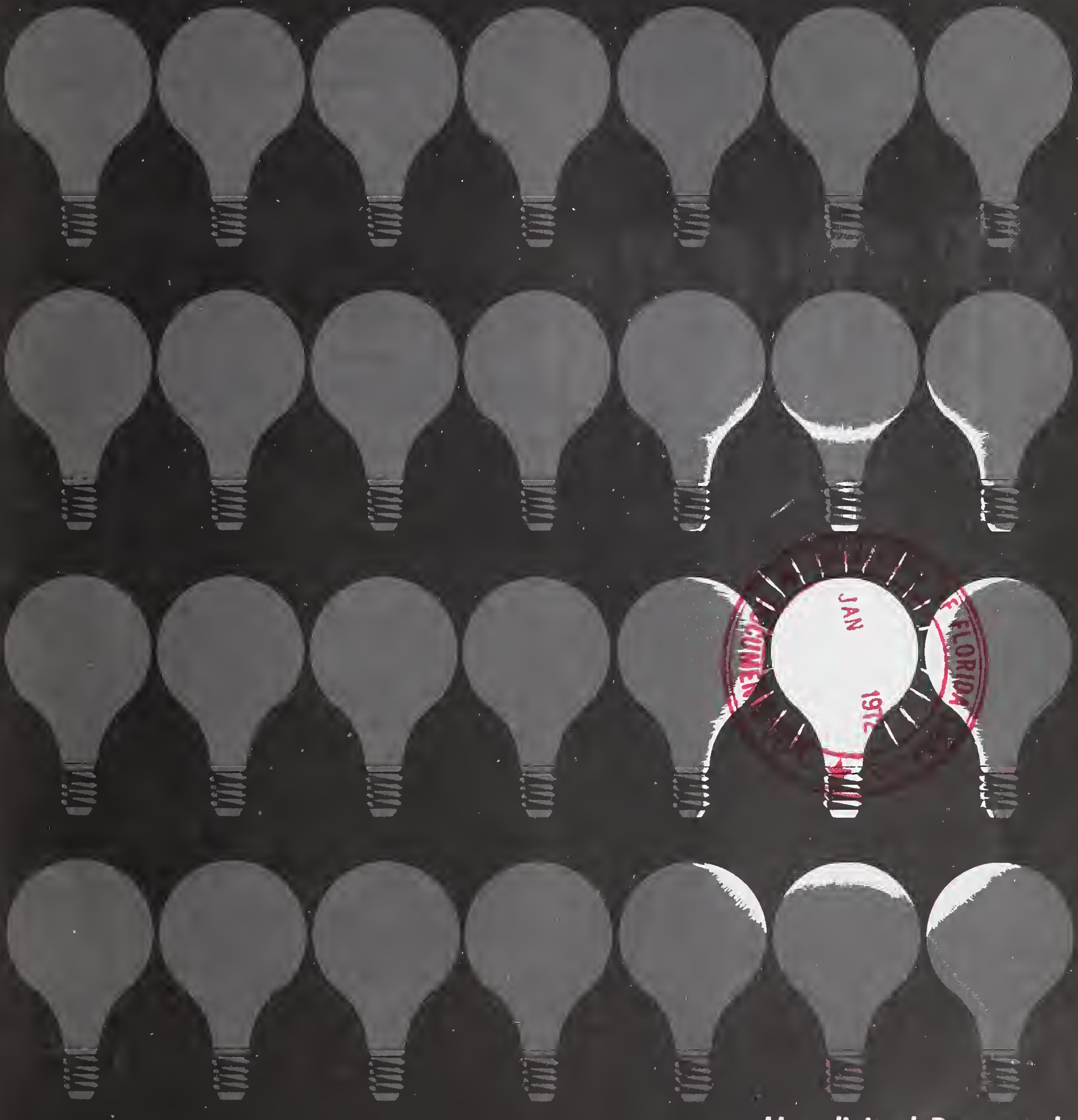

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Unsolicited Proposals

DEFENSE INDUSTRY BULLETIN

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The *Bulletin* serves as a means of communication from the Department of Defense and its components to actual or potential defense contractors, labor and other interests. It provides information and guidance on official policies, programs, procedures, activities and developments concerning the management of research, development and acquisition of equipment, supplies and services needed in the national defense effort. It seeks to stimulate thought by the defense-industry team in solving problems allied to the defense effort.

The *Bulletin* is distributed free of charge to organizational elements of the DOD, its components and other Government agencies for official use.

Requests should be submitted on organizational letterhead, stating the requestor's relationship with the DOD and industry, to: Editor, Defense Industry Bulletin, Defense Supply Agency, Cameron Station, Alexandria, Va., 22314. All others may obtain the *Bulletin* by subscription from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Annual subscription rate is $1; single copies are 30¢.

Suggestions concerning possible subjects for future issues are welcome and should be sent to the Editor.

Contents of this magazine may be freely reprinted. Mention of the source is appreciated.

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"We are seeking new initiatives for [*defense*] *research and development programs. . . . We are now trying to put ourselves into such a position that in the future we really will have choices. . . . We can't afford to remain locked into a situation in which our only choices,* i.e., *alternative ways of meeting accepted military needs, are not only few in number but expensive. If we are to have these choices, we must make more new program starts than we have in the past. . . .*[1]

Guidelines for Submission of Unsolicited Proposals

Many companies have a sincere desire to apply their expertise and facilities to Defense Department problems by undertaking research and development programs. Such programs may originate with solicited or *unsolicited* proposals.

An unsolicited proposal to perform research and development is distinguished from a proposal requested by a Defense Department procuring activity from qualified sources. It is a document voluntarily initiated and submitted by a prospective contractor to a DOD research or procuring agency offering a possible solution to a defense problem or requirement.

In the process of deciding to prepare an unsolicited proposal, the potential submitter should know the answers to these basic questions:

- What are the criteria for deciding whether or not to submit an unsolicited proposal?
- What are some of the ground rules for preparing such a research and development proposal?
- On what basis is an unsolicited proposal evaluated by a DOD agency?
- To whom should such a proposal be submitted?

To provide answers to these questions, this article outlines the guidelines established by the Army, Navy, and Air Force for the preparation and submission of unsolicited proposals for research and development programs. It is based on the most current instructions provided by the three Services. The guidelines for each Military Service follow beginning on page 2.

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[1] *Dr. John S. Foster Jr., Director, Defense Research and Engineering, at Joint DOD-National Security Industrial Association Symposium, Washington, D.C., Aug. 11, 1971.*

Army Guidelines

The Army has a continuing interest in receiving and evaluating proposals containing new ideas, suggestions, and inventive concepts for weapons, supplies and equipment. However, as government personnel and contractors are constantly engaged in research and development activities, the substance of an unsolicited proposal may already be known to government or contractor employees, or may even be in the public domain. For this reason, the Army must ensure that the submitter understands the conditions under which a proposal will be accepted for evaluation.

The acceptance of an unsolicited proposal by the Army does not imply a promise to pay, a recognition of novelty or originality, or any relationship which might require the Government to pay for use of information to which it is otherwise lawfully entitled. However, the Army has no intention of using any proposal in which the submitter has property rights without proper compensation.

Any material submitted to the Army will, in the evaluation process, be restricted to only those persons having an official "need to know" for the information for purpose of evaluation.

A Memorandum of Agreement, stating these conditions, must be signed by the submitter, and the agreement is retained by the Army. The submitter keeps a copy for his records.

Criteria for Determining Whether To Submit a Proposal

In deciding whether or not to submit an unsolicited proposal, an industrial organization should ask itself, "Are we uniquely qualified or particularly competent in this field?" Even if the answer is no, the question can be rephrased to ask, "Are we at least as well qualified technically as anyone else?" Finally, the question asked should be, "Would it make sense for the Government to give us a contract for this work?"

If a company is certain it is *uniquely* qualified to tackle a problem, it is probably in a position to write a highly acceptable proposal, with a good chance for receiving support. One of the rules of thumb to be considered for any proposal is: If you can demonstrate uniqueness by virtue of personnel, proprietary techniques, patents, or facilities, spell it out. It all adds up to being able to offer the Government the most economical answer to its problem.

Not infrequently, companies are anxious to diversify their activities and considerable effort may then go into a proposal in vain. Unless a company can demonstrate that its activities in another field are applicable to the military problem at hand, the chances are good that the proposal will not be accepted. Insofar as research and development is concerned, the Government is not normally in the role of assisting industrial organizations to diversify their activities.

The foregoing are some of the factors that must be weighed before deciding to submit an unsolicited proposal.

Preparation Ground Rules

Summary. First, as with any technical document exceeding 5 or 10 pages, a summary is desirable. This permits the sense of the proposal to be gathered at once, and helps orient the evaluator.

Introduction. Following the summary, an introduction may be desirable, depending upon the circumstance. Basically, an introduction is intended to orient the evaluator, give him the background, acquaint him with the problem, and lead him into the body of the proposal.

If the summary has already done this, it is not worthwhile repeating the entire message solely for the sake of having an introduction. In some cases, the introduction is the logical place in which to present additional information that will help justify the approach selected. This may take the form of information regarding some unique process or technique developed by the company particularly well suited to a military problem solution, or a brief explanation of the potential the proposal offers for other problems facing the Army agency. In either case, the intent is the same—to offer evidence supporting the proposal.

Statement of Problem. The next major portion of the proposal is usually the statement of the problem. The intent of this section is to demonstrate understanding of the problem. In many respects, it is one of the most difficult sections to prepare because it should present enough information to demonstrate appreciation of the subtleties of the problem without going into a prolonged technical analysis. Remember that the proposal is intended to demonstrate the company's method or approach to solving the problem, not its ability to restate the government's problem.

In rare cases, the statement of the problem may justifiably require supporting information, such as an historical background or a summary of the present state of the art. To avoid cluttering up the body of the proposal, it may be well to extract the pertinent facts of such sections and relegate the details to an appendix.

Proposed Approach. Once the problem has been stated, the proposed approach to the problem should be given. This is the heart of the proposal and is the section that usually receives paramount attention. A well stated understanding of the problem, the best facilities, the most talented personnel, and all of the other advantages that a potential contractor can offer, may be unimportant if he does not offer a logical and promising approach.

Personnel Resumes. The makeup and organization of the team pro-

posed for the work should be included with resumes of the team members in an appendix.

Some contractors choose to present resumes of people other than those who will be engaged on the program. To the extent that such resumes indicate the attributes of personnel who will make supervisory or tangential contributions to the program, this may be worthwhile. On the other hand, resumes of people who by their title or position do not appear even remotely connected with the program could very well be construed as "padding."

Work Schedule. In some programs, the work proposed may be scheduled in several phases or work units. If so, it is desirable to present a section entitled "schedule," in which the work is displayed along the projected period of performance. For the sake of convenience and clarity, a simple bar graph may prove effective. In many instances, it may be worthwhile to include a section on "specific qualifications" as a useful means for presenting information on past or concurrent efforts that have specific bearing on the proposed program. In particular, specific contracts in related fields should be mentioned. This section may make reference to facilities or other company experience presented in an appendix.

Scope, Cost, and Time. Finally, the body of the proposal should contain a firm contractual statement summarizing the scope of work and providing a cost estimate and work schedule. A detailed cost breakdown can be relegated to an appendix.

Appendices. The various appendices should be attached to the body of the proposal. Any information or photographs that will demonstrate ability to undertake the work should also be presented.

Basis of Evaluation by Army

There are various policies and practices that govern proposal evaluation and important factors which the evaluator must keep in mind. Basic rules for evaluating research and development are contained in the Armed Services Procurement Regulation (ASPR).

Of primary importance is the technical superiority of the proposal. All the resumes, annual reports, leather-bound covers, and three-color overlays in a proposal cannot be expected to sway the evaluator's opinion of a technical presentation. The submitter *must* demonstrate that he:

- Fully understands the problem.
- Has a well thought-out approach which shows signs of promise if executed as described.

On many occasions, proposals have been rejected because the submitter has underrated the importance of technical superiority of a proposal. In any proposal, revolutionary ideas that offer the possibility of significant scientific breakthroughs are attractive. However, even old, well established approaches have won contracts when reasons for a previous failure of an approach are analyzed, adequately investigated, and a new and promising solution proposed.

A clear understanding of the ultimate needs of the government agency for whom the work is proposed will also assist in proposing attractive approaches. Often, before preparing a proposal, it may be helpful to discuss it with representatives of the agency concerned. If a proposal involves development of a material that will be used in large quantities, then what will be the effect of an approach based on material in very short supply? In many instances, availability of material may have significant effect on a given approach. Similarly, if a submitter has done his homework, he may find that the Army agency itself has done some work on the same approach, and may have some very definitive ideas about it.

A technical evaluation of a proposal may sometimes be performed on the basis of the technical portion of the proposal alone. Cost information will be deliberately denied to the technical evaluator to prevent the cost factor from influencing his decision. He is asked to rate a proposal simply either acceptable or unacceptable, and to state reasons for acceptability or unacceptability. Then cost data is brought into the picture. In other instances, a proposal may be evaluated taking into consideration both technical and cost factors at the same time.

When evaluation is completed, the submitter is informed that the Government is interested in supporting his proposal, or that his proposal is rejected. Sometimes the details of technical evaluation will be provided. Other times only a statement of "no interest" or "lack of potential benefit to our research and development programs" may constitute the rejection. In any event, the length of the reply does not constitute the measure of the evaluation. *Every* proposal is carefully and thoroughly evaluated by highly competent personnel in the field or fields involved in the proposal.

Where To Submit

Unsolicited proposals for solutions to Army problems or requirements should be submitted, in triplicate, to an activity of the Army Materiel Command (AMC) concerned with the work proposed or, if this cannot be readily determined, to:

Hq., Army Materiel Command
Attn: AMCRD-PS-P
Washington, D.C. 20315

Following is a list of AMC research activities and major commodity commands with a brief explanation of their mission responsibilities:

Independent Laboratories or Centers

Army Air Mobility Research and Development Laboratory

NAS Moffett Field, Calif. 94035

(Includes Ames Directorate, Moffett Field, Calif.; Langley Directorate, Langley Field, Va.; Lewis Directorate [Engine Research], Cleveland, Ohio; and Fort Eustis Directorate, Fort Eustis, Va.)

Accomplishes basic, applied, exploratory, and advanced development research in the field of subsonic aerodynamics applicable to aircraft, missile and other aerodynamic devices.

Army Aberdeen Research and Development Center

Aberdeen Proving Ground, Md. 21005.

- *Ballistic Research Laboratories* conduct basic and applied research in interior and intermediate ballistics, kinematic analyses of automatic weapons mechanisms, exterior and terminal ballistics. Determine vulnerability of all types of military targets, both materiel and personnel, to the various lethal mechanisms. Prepare firing tables for all Army weapons except designated guided missiles.

- *Army Materiel Systems Analysis Agency* conducts systems analysis studies in order to develop measures of small arms system effectiveness, evaluates concepts and proposals in accordance with these measures, and develops techniques and methodology associated with the systems analysis function. Participates in the design and analysis of experiments to define performance as a function of system parameters. Establishes the requirement for data banks on subjects basic to AMC systems analysis activities and provides systems analysis of input data, such as hit probabilities, probabilities of incapacitation, etc., for larger systems studies performed by other agencies or military services.

- *Coating and Chemical Laboratory* plans, manages and directs basic and applied research, plus engineering investigations, in the fields of automotive chemicals, organic and semi-organic coatings, conversion coatings, cleaners, fuels and lubricants and related materials; coordinates the total research program of AMC in the fields of fuels, lubricants and related materials. Participates in the standardization and industrial preparedness program within these assigned fields, and provides technical assistance to AMC major subordinate commands and activities on problems arising in assigned fields.

- *Human Engineering Laboratories* perform research in life sciences regarding human factors in quantifying the capabilities and limitations of human performance in tasks associated with small arms. Conduct experiments and analyses to obtain data which define such performance as a function of weapon design parameters. Conduct simulation of the environmental hazards, such as noise, blast, etc., to which a firer is subjected during use of the weapons in order to assess their effect on human performance. Assist AMC design agencies in the application of human factors engineering principles to design and development of end items.

- *Army Nuclear Defense Laboratory, Edgewood Arsenal, Md. 21010,* conducts research and field experiments in the nuclear weapons effects areas of initial radiation, residual radiation and fallout, shielding, and thermal radiation phenomena. Provides technical information and assistance in the fields of radiological and nuclear defense and health physics. Provides environmental monitoring and other radiological safety support. Develops radioactive waste disposal methods and shipping containers.

Army Materials and Mechanics Research Center

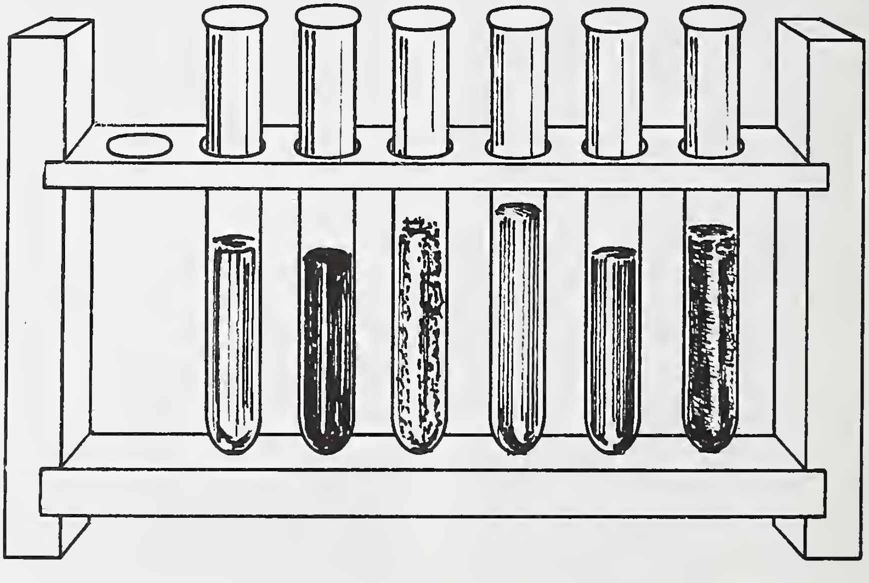
Watertown, Mass. 02172

Manages and directs that portion of the AMC materials research program conducted within its own laboratories, as assigned by the Director of Research and Engineering, Headquarters, AMC, including basic scientific research, and research in metals, ceramics, and other materials. Coordinates the total materials research program of the AMC. Coordinates and manages a program of testing techniques in conjunction with the quality assurance program, and executes assigned portions of standardization programs.

Harry Diamond Laboratories

Washington, D.C. 20438

Performs basic and applied research in, but not restricted to, the fields of radiating or influence fuzing, time fuzing (electrical, electronic, decay, or fluid), and selected command fuzing; for target detection and signature analysis; and for target intercept phase of terminal guidance. Performs weapon systems synthesis and analysis to determine characteristics which will effect fuze design to



achieve maximum immunity to adverse influences, including counter-countermeasures, nuclear environment, battlefield conditions, and high altitude and space environments. Performs basic and applied research, in support of assigned missions, or as directed by the Director of Research and Development, AMC, on instrumentation, measurement and simulation, on materials, components, and subsystems including electronic timers for weapons and on selected advanced energy transformation and control systems. Conducts basic research in the physical sciences, as directed by Director of Research and Development, AMC. Performs basic and applied research on fluid devices and systems.

Natick Laboratories
Natick, Mass. 01762

Accomplishes research and development in special aspects of the physical, engineering, environmental, and life sciences to meet military requirements for soldiers' equipment in the commodity categories of clothing, footwear, and body armor; organic materials, textiles, tentage and equipage; subsistence and food services equipment; containers and materials handling equipment; POL handling and dispensing equipment; field support equipment (including printing and composing equipment); to develop equipment and techniques for air drop of Army personnel, supplies and equipment. As assigned, supports other components of Department of the Army and the Defense Supply Agency, with respect to applications engineering and standardization programs for designated commodity areas.

AMC Major Subordinate Commands

Army Aviation Systems Command
St. Louis, Mo. 63103

Integrated commodity management of aeronautical and air delivery equipment and of test equipment that is part of, or used with, assigned materiel. Basic and applied research concerning assigned materiel development to include an item aircraft, airframe structural components, ground support equipment, wheel and brake systems, etc., gas turbine, jet engines, internal combustion radial and horizontally opposed aircraft engines, and aircraft hydraulic pumps, starters, etc.

Army Electronics Command
Fort Monmouth, N.J. 07703

Responsible for the research, development, procurement, maintenance support and supply of communication and electronic equipment and systems. Principal interests are communications, communications security, electronic warfare, aviation electronics (avionics), night vision, combat surveillance, target acquisition, electronic intelligence, photographic and microfilming, air defense electronics, identification-friend or foe (radar) systems, automatic data processing, radar, meteorological and electronic radiological detection materiel (except fire control, radar, computers, and closed circuit computer systems integral to a weapon system), electric power generation equipment, and related assigned special purpose and multi-system test equipment, component parts and materials. Conducts continuing research (relating to the missile program) in the fields of missile electronics warfare, missile vunerability, and missile surveillance. Coordinates the missile electronics countermeasures efforts of the Army.

Army Missiles Command
Redstone Arsenal
Huntsville, Ala. 35808

Exercises integrated commodity management of assigned materiel, *e.g.*, free rockets, guided missiles, ballistic missiles, target missiles, air defense missile fire coordination equipment, special purpose and multi-system test equipment, missile launching and ground support equipment, and missile fire control equipment. Conducts a basic and applied research program with respect to assigned materiel and such other research projects as may be assigned by Headquarters, Army Materiel Command.

Army Mobility Equipment Command
St. Louis, Mo. 63166
(Research and development effort is accomplished through Army Mobility Equipment Research and Development Center, Fort Belvoir, Va. 22060.)

Accomplishes basic and applied research and development with respect to assignel items of equipment, *e.g.*, rails, marine and amphibious equipment, construction, electric power generating, bridging and assault stream crossing, fire fighting, prefabricated buildings, waste disposal, heating and air conditioning, night vision, camouflage and concealment, mine warfare, barrier and intrusion detection, demolitions, water purification, petroleum storage and distribution, industrial engines, and land navigation.

Army Munitions Command
Dover, N.J. 07081

- *Edgewood Arsenal, Md. 21010.* Conducts research and development in the offensive and defensive aspects of physiologically active chemical compounds, chemical degradation of materials, aerosol physics, basic research in the mechanism of action of body systems; and carry out research and development on smoke, incendiaries, and non-electronic antisurveillance techniques.

- *Frankford Arsenal, Philadelphia, Pa. 19137.* Operates a commodity center for small caliber munitions, cartridge-activated and propellant-actuated devices. Conducts research with respect to assigned commodities including specialization in optical materials and technology, metallurgy, of non-ferrous and reactive metals, materials degradation, power transmission fluids for small control mechanisms and special synthetic lubricants, materials and technology pertinent to miniaturization of ammunition. Performs design and development for assigned commodities and for artillery shell metal parts and cartridge cases.

- *Picatinny Arsenal, Dover, N.J. 07801.* Operates a commodity center for nuclear munitions; radiological materiel; and artillery and mortar ammunitions, and non-chemical and non-biological bombs, mines, grenades, demolition devices, explosives and explosive devices, propellants, pyrotechnics, boosters, JATOs, and rocket and missile warhead sections. Conducts research with respect to assigned commodities including specialization in the following fields: plastics and adhesives, solid and liquid propellants, dynamics of materials, non-metallic materials other than rubber, greases, lubricants, corrosion preventives, and fuels. Performs design and development for assigned commodities and for small caliber munitions fuzes in support of Frankford Arsenal; for impact fuzes, inertial fuzes, safing and arming devices and barometric devices for assigned commodities and in support of Army Munitions Command's commodity centers. Operates the DOD Plastics Technical Evaluation Center.

Army Tank-Automotive Command,
Warren, Mich. 48090

Conducts applied research, development and engineering of tank-automotive vehicles and components for the Army and other Defense Department activities. Typical research and development programs include power train components, suspensions, trucks, trailers, tires, new concepts for mobility, armor concepts, weapon systems for tanks and combat vehicles, and all types of vehicle engines and accessories.

Army Test and Evaluation Command
Aberdeen Proving Ground, Md. 21005

Plans and conducts engineering and service tests and evaluations; supports engineering design, production and post-production tests, and participates in troop test planning. A number of installations and activities are involved, such as Dugway Proving Ground, White Sands Missile Range, Aberdeen Proving Ground (D&PS), Army Electronic Proving Ground, Yuma Proving Ground, and Jefferson Proving Ground.

Army Weapons Command
Rock Island Arsenal, Ill. 61201

Exercises integrated commodity management of assigned materiel and assigned missions in support of other Army Materiel Command or Defense Department elements having centralized management responsibility for weapons, including aircraft weapon systems, artillery weapons, infantry weapons, and crew-served weapons (including those weapons mounted on any type of vehicle, tank-like weapon systems), self-propelled artillery and conducts or manages research, design and development of artillery, artillery mounts, recoil mechanisms, carriages, loaders, handcarts, arms racks, certain target materiel, common tools, tool sets, shop equipment, design and development of individual weapons, machine guns, grenade launchers, secondary armament for combat and tactical vehicles, aircraft armament subsystems (gun type) spotting weapons, mounts and pods for mission weapons, linkers and de-linkers. The command is also responsible for research, design and development of mortars, recoilless rifles, cannon assemblies and components.

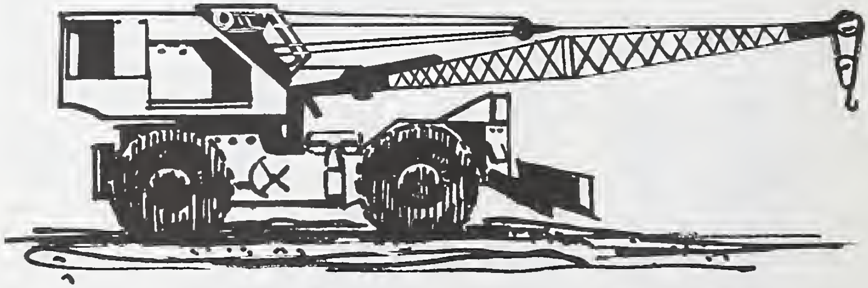
- *Rock Island Arsenal.* Research, design and development, product and production engineering, value engineering, maintenance engineering support as assigned, procurement and production, quality assurance, technical evaluations, special cost estimates and standardization projects as assigned for the following mission items: armament subsystems for aircraft, components for artillery and air defense systems, secondary armament and gun mounts for surface vehicles, vehicle turret components, small arms weapons, and other assigned equipment pertinent to mission items.
- *Watervliet Arsenal.* Research, design and development, product and production engineering, value engineering, maintenance engineering support as assigned, procurement and production, industrial readiness, planning, quality assurance, and standardization projects as assigned for mortars, recoilless rifles, cannon assemblies and components, training devices and associated equipment for the items listed above. Operation control of the Ridgewood Army Weapons Plant as a part of the Weapons Command production base for industrial readiness.

Army Safeguard Logistics Command
Redstone Arsenal, Ala. 35809

Provides mission essential logistic support to the Safeguard System except for nuclear munitions and auxiliary equipment.

Army Small Arms Systems Agency
Aberdeen Proving Ground, Md. 21005

Serves as project manager-like management agency for AMC responsibilities for Army Small Arms Program (less M16A1 Rifle, GLAD Program, and associated ammunition). Plans, manages, and directs exploratory, advanced, and engineering development programs in the research, development, test, and evaluation area, plus advanced production engineering and procurement as required for newly developed small arms weapon systems. Materiel items include individual and crew-served infantry weapons through caliber .60; grenade launchers; and associated ammunition, fire control equipment and accessories. All such materiel for ground and ground-vehicular applications are included in the scope of responsibilities.



Navy Guidelines

An unsolicited research proposal is a document initiated and submitted by a prospective contractor to the Navy Department with the objective of obtaining a contract to perform basic research, applied research, or exploratory development. It is usually the result of a decision by a prospective contractor that he has conceived something new or novel and that, if sponsored, he can demonstrate that the idea has both scientific merit and a naval application. In general, proposals fall in one of three classifications:

- Basic research proposals to perform work which will contribute a fundamental knowledge in a scientific area.
- Applied research proposals to use existing scientific knowledge to provide a new naval capability or substantially improve an existing capability.
- Exploratory development proposals to undertake investigations and studies to demonstrate new techniques in naval functional areas, or feasibility of a system, subsystem, or component.

The Office of Naval Research (ONR) sponsors research in scientific fields of major concern to the Navy. Research funded by ONR is conducted in part under contract by universities, nonprofit institutions, and industrial establishments; and in part by Navy laboratories.

Two major types of programs are supported by ONR. First, fundamental knowledge that may solve Navy problems is acquired through support of long-range research. Contracts are generally awarded in response to unsolicited proposals. Such proposals are evaluated on their relevance to Navy needs, the scientific merit of the proposed research program, the competence of the investigator, and the facilities available to conduct the proposed research. Second, a program of applied research and exploratory development is conducted through studies and tests of novel concepts in naval operational systems. In this area, proposals are frequently requested from qualified sources, based on a description of the objective.

ONR research staffs, manned by scientists who serve as scientific administrators, concentrate on long-range scientific research. Their job is to keep themselves informed about the best and most imaginative research underway in the scientific community, review research proposals submitted by prospective contractors, select those most useful to the research program and which are relevant to anticipated Navy needs, and monitor the research while it is being carried out. Principal scientific and technical programs of current interest to ONR are listed beginning on page 10.

Preliminary Proposal

Before a proposal document is prepared, consideration should be given to what might be called the "pre-proposal" stage of the effort. Since at this stage there is no certainty that financial support is forthcoming, it is appropriate that any preparatory work be limited to an effort which will require a minimum expenditure of funds. What should this effort encompass?

First, the prospective contractor should sort out the obvious technical barriers in his proposal and attempt to acquire sufficient technical data to indicate that they are subject to solution. On occasion, he may propose research or development of an invention conceived independently of a government contract but not yet actually reduced to practice, *i.e.*, actually built and tested. If so, consideration should be given to the rights in the invention which the Government will acquire if the invention is reduced to practice under the contract. At the minimum the contract will require the grant to the Government of a royalty free license to use the invention for governmental purposes. In some circumstances, greater rights, including the grant of outright ownership, may be required.

After the prospective contractor has assembled enough information to adequately describe a new or novel concept to solve the obvious technical problems and, if possible, to describe the ultimate military applications, he is ready to prepare a preliminary proposal. In general, the format for preparation of a proposal is:

- A general statement requesting consideration of the proposal.
- A brief review of the scientific background of the proposed investigation.
- A reasonably complete technical description stating the objectives of the project, and the scientific methods to be employed.
- Description of general and special facilities available for performing contemplated work.
- Name and background of the principal investigator(s) and professional associates.
- Bibliography of pertinent publications.
- Other research projects, governmental and otherwise, currently being undertaken by the principal investigator stating the title, sponsor of research, and number of years of support.
- Statement whether proposal is being submitted to any other agency for possible financial support or assistance.
- Estimated duration of the project and a yearly budget breakdown.

For a preliminary proposal, detailed information in the last three sections in the foregoing format is not necessary.

Review of Preliminary Proposal

The next decision to be made is whether a preliminary proposal should be mailed to a Navy agency or a personal contact made to discuss the document. If it is at all possible, it is advantageous to make one or more personal contacts to discuss the proposal with interested individuals. Discussion makes it possible to obtain detailed comments and suggestions which are difficult or even impossible to convey in correspondence.

One source of discouragement to the prospective contractor is the referral from one office to another in the search for the office or individual who is responsible for the area covered by his proposal. The Navy and other Military Departments are large, complicated organizations consisting of central and field activities with various responsibilities and interests. Therefore, the prospective contractor must accept the fact that it might require some effort to locate the proper responsible office or individual to evalute his preliminary proposal.

In any review of a preliminary proposal, either by correspondence or personal contact, the prospective contractor should carefully note any specific technical objections or reference to lack of military application. It is usually pointless to prepare a final proposal if it does not contain sufficient information to contradict the objections. Preliminary discussions often reveal information which may make it advantageous for the prospective contractor to alter his original concept so that his work will more nearly conform with a military requirement of which he was originally unaware.

Formal Proposal

After the preliminary proposal has been thoroughly reviewed, the prospective contractor has to evaluate the results of this review to determine if he should submit a formal proposal. Many important questions must now be answered.

- Was there sufficient interest to justify the expense of a formal proposal?
- If the reviewing office indicated an interest, was there any reason to suppose that funds were available to support such an effort? Did the reviewing office suggest that the submission be delayed until the next fiscal year when funds would be available?
- If the concept has a military application, should it be submitted to the Navy Department or some other Military Department?

If the prospective contractor decides to submit a formal proposal, it is often satisfactory to use the preliminary proposal as the basic structure embellished with additional details. Excellent features of an unsolicited proposal may receive little attention if the technical information and format are not adequate to convince the prospective customer that the proposal is worthy of acceptance.

Many factors influence the acceptance of a proposal. One of these is the arrangement of technical groups within a research organization. Scientific disciplines are well defined and an unsolicited proposal for basic research in a scientific area is usually reviewed by an investigator trained in the related discipline. This arrangement assists the processing of basic research proposals. Occasionally, interdisciplinary proposals make their appearance but they are the exception rather than the rule. Organizations which support applied research and exploratory development are not as sharply delineated as the basic research organizations; therefore, it is usually more difficult to find the cognizant group.

In addition, a proposal which has a military application should be based on a careful investigation of the following aspects:

- Is the military application a new one or an improvement of current practice? Does it appear that the successful completion of the work will provide a technique or equipment which will substantially alter naval capability?
- Is it technically feasible to integrate the new technique or equipment with existing systems?

A prospective contractor who investigates the military aspects of a new concept can often decide for himself whether or not the idea is worthy of the expense of a formal proposal. Since the military specialist who processes the proposal follows somewhat the same procedures, he is at once impressed with a proposal which shows signs of having been prepared as a result of such an analysis.

Many applied research proposals are technically complicated to such a degree that final answers are available only after a meticulous investigation. In other instances, a first look at some proposals immediately raises some questions which a prospective contractor should have been able to answer by a review of existing knowledge or a simple experiment. Such information voids in a proposal are definitely a handicap to acceptance. Assumption creates a doubt in the validity of the other sections of the proposal and augments its susceptibility to rejection.

A prospective contractor is not expected to undertake a research program before he submits a proposal, but it is definitely to his advantage to provide information so that rejection can only be based on specifics.

Finally, in a formal proposal the costs involved should be considered carefully. With decreasing military budgets, good technical proposals with unrealistic financial figures are worthy of mere verbal support and of no use to either the prospective contractor or the military. The successful contractor in the applied research and exploratory development area is the one capable of producing new or novel military applications of research and technical information, and processing the complete technical investigation at a reasonable cost.

Navy Contacts

The Office of Naval Research has branch offices in Boston, Chicago, Pasadena, and London, and area offices in New York and San Francisco. Resident representatives are located in the United States at or near major universities and institutions within the branch office areas.

The branch offices provide direct liaison between ONR and scientific institutions in their areas. Each branch office has a scientific department composed of a chief scientist and several associated scientists who maintain contact with scientific developments in the branch office area and regularly visit ONR contractors. Both the scientific and contract administration departments of the branch offices are prepared to advise and assist prospective contractors in preparing proposals. The branch offices also have patent counsel offices which provide assistance and consultation to contractors in patent and copyright matters. Addresses are:

Office of Naval Research
Ballston Tower #1
800 N. Quincy St.
Arlington, Va. 22217

Boston Branch Office Area and Resident Representatives

Office of Naval Research Branch Office
495 Sumner St.
Boston, Mass. 02210
Phone: (617) 542-5100, Ext. 425

New York Area Office
207 W. 24th St.
New York, N. Y. 10011
Phone: (212) 620-6812

Office of Naval Research
Resident Representative
207 W. 24th St.
New York, N. Y. 10011
Phone: (212) 620-6812

Office of Naval Research
Resident Representative
Harvard University, Room 206
473 Broadway
Cambridge, Mass. 02138
Phone: (617) 495-4688

Office of Naval Research
Resident Representative
Massachusetts Institute of Technology, Room E19-628
Cambridge, Mass. 02139
Phone: (617) 864-6900, Ext. 2581

Office of Naval Research
Resident Representative
Federal Bldg., Room 209
Church and Fitzhugh Streets
Rochester, N.Y. 14614
Phone: (716) 546-4900, Ext. 1469

Office of Naval Research
Resident Representative
University of Pennsylvania
The Moore School of Electrical Engineering
200 S. 33rd St.
Philadelphia, Pa. 19104
Phone: (215) 386-5116

Office of Naval Research
Resident Representative
Princeton University
Theobald Smith House
James Forrestal Campus
Princeton, N. J. 08540
Phone: (609) 452-9140

Office of Naval Research
Resident Representative
Columbia University
Lamont-Doherty Geological Observatory
Torrey Cliff
Palisades, N.Y. 10964
Phone: (914) 359-2900, Ext. 441

Office of Naval Research
Resident Representative
Carnegie-Mellon University
Room 407 Margaret Morrison Bldg.
Pittsburgh, Pa. 15213
Phone: (412) 681-6366

Quality Assurance and Engineering Division
Office of Naval Research Boston Branch
Massachusetts Institute of Technology
Charles S. Draper Laboratory
Bldg. DL 12-116
148 Sidney St.
Cambridge, Mass. 02139
Phone: (617) 864-6900, Ext. 7305

Chicago Branch Office Area and Resident Representatives

Office of Naval Research Branch Office
536 S. Clark St.
Chicago, Ill. 60665
Phone: (312) 353-6065

Office of Naval Research
Resident Representative
The Ohio State University Research Foundation
1314 Kinnear Road
Columbus, Ohio 43212
Phone: (614) 469-5628

Office of Naval Research
Resident Representative
University of Michigan
Box 622
Ann Arbor, Mich. 48105
Phone: (313) 764-6266

Office of Naval Research
Resident Representative
Purdue University
Graduate House, Room 85
West Lafayette, Ind. 47907
Phone: (317) 749-2150

Office of Naval Research
Resident Representative
University of Illinois

605 S. Goodwin Ave.
Urbana, Ill. 61801
Phone: (217) 333-2430

Office of Naval Research
Resident Representative
University of Minnesota
Room 164, Office Building
320 16th Ave. S.E.
Minneapolis, Minn. 55455
Telephone: (612) 373-3046

Office of Naval Research
Resident Representative
University of Kansas
Marvin Hall
Lawrence, Kan. 66044
Phone: (913) 864-3995

Office of Naval Research
Resident Representative
University of Texas
1105 Guadalupe
Lowich Building
Austin, Tex. 78701
Phone: (512) 475-5533

Office of Naval Research
Resident Representative
Room 902, Federal Building South Street
P.O. Box 30440
600 South St.
New Orleans, La. 70130
Phone: (504) 527-2991

Office of Naval Research
Resident Representative
University of Denver
Room 118, Columbine Hall
2030 E. Evans
Denver, Colo. 80210
Phone: (303) 753-2976

Office of Naval Research Engineering Support Office
University of Texas at Dallas
P.O. Box 1419
Richardson, Tex. 75080
Phone: (214) 231-1471 Ext. 396

Office of Naval Research Engineering Support Office
University of Iowa
Physics Research Center
Iowa City, Iowa 52240
Phone: (319) 353-4494

Pasadena Branch Office Area and Resident Representatives

Office of Naval Research Branch Office
1030 East Green St.
Pasadena, Calif. 91101
Phone: (213) 795-5971

San Francisco Area Office
50 Fell St.
San Francisco, Calif. 94102
Phone: (415) 556-0131

Office of Naval Research
Resident Representative
Stanford University
Room 210, Varian Laboratory of Physics
Stanford, Calif. 94305
Phone: (415) 321-2300 Ext. 4187

Office of Naval Research
Resident Representative
50 Fell St.
San Francisco, Calif. 94102
Phone: (415) 556-0131

Office of Naval Research
Resident Representative
University of California
Room 201, Building T-9
Berkeley, Calif. 94720
Phone: (415) 642-2345

Office of Naval Research
Resident Representative
University of Washington
3710 Brooklyn Ave., N.E. Unit 2
Seattle, Wash. 98105
Phone: (206) 543-2656

Office of Naval Research
Resident Representative
University of California, San Diego
P.O. Box 109
La Jolla, Calif. 92037
Phone: (714) 453-2000 Ext. 1275

Office of Naval Research
Resident Representative
University of Arizona
Room 421, Space Science Building
Tucson, Ariz. 85721
Phone: (602) 884-3535

Southeastern Area and Resident Representatives

Contract Administrator Southeastern Area
Office of Naval Research
2110 G St., N.W.
Washington, D.C. 20037
Phone: (202) 254-4051

Office of Naval Research
Resident Representative
Johns Hopkins University
Whitehead Hall, Room 205
34th and Charles Streets
Baltimore, Md. 21218
Phone: (301) 366-3300 Ext. 487

Office of Naval Research
Resident Representative
Georgia Institute of Technology
Room 276, Engineering Experiment Station
Atlanta, Ga. 30332
Phone: (404) 526-4374

Office of Naval Research
Resident Representative
University of Florida
Room 427, Engineering & Industries Building
Gainesville, Fla. 32601
Phone: (904) 392-0996

Office of Naval Research
Resident Representative
Research Institute
University of Alabama in Huntsville
P.O. Box 1247
Huntsville, Ala. 35807
Phone: (205) 895-1238

Navy Research Programs

Atmospheric Sciences. Includes cloud physics, storm dynamics, atmospheric electricity, general circulation, solar/terrestrial relationships, and instrumentation. Particular attention is being paid to electrical hazards in the atmosphere, to local weather modification, and to their relationship to naval operations.

Geography. Includes study of coastal and deltaic processes, with emphasis on the nature, pattern, and relationships of the various environmental elements in the coastal zone. Attention is on improved methods of environmental data acquisition (including remote sensing), storage, analysis, and display, and on the development of environmental prediction techniques through use of numerical models.

Earth Physics. Includes study of the seismic, electrical, and lithological nature of the earth's crust. Attention is on improved techniques for precise prediction of earth and ocean (coastal) tides using gravimetry, long-baseline interferometry, and satellite altimetry.

Arctic Research. Includes study of the acoustic, chemical, and biological properties of arctic waters and study of sea ice physics, including ice thickness and ice movement dynamics. Emphasis is on long-range arctic climatology and energy budget prediction and improved numerical models for atmospheric and oceanic circulation throughout the Arctic.

Oceanography. Sponsors effort in four major areas:

- Physical and chemical oceanography, with emphasis on physical properties and distribution, ocean circulation, internal motion in the sea, the benthic boundary, estuarine studies, and chemical studies in the marine environment.
- Air-sea interaction.
- Marine geology and geophysics, with emphasis on petrology and geochemistry, sediments and sedimentation, submarine geomorphology, engineering properties, seismology, gravity, and geodesy.
- Oceanic biology, with emphasis on bioacoustics, marine ecology, noxious marine animals, and biodeterioration.

Advanced oceanographic instrumentation is included in each of these areas.

Ocean Technology. Covers interdisciplinary engineering research in special tools and equipments for performing useful naval functions in the underwater environment.

Physics. Covers investigations in ionic and plasma physics, including gaseous electronics; laser and infrared physics; holography; photoconductivity and luminescence; laser materials; solid state physics, including magnetism and magnetic materials; dielectrics; metal and semiconductor physics; critical phenomena; microwave acoustics; atomic and molecular physics; superconductivity; and superconducting technology. A special interest is research in balloon materials and balloon technology, including high-altitude balloon flights for physical experimentation.

Nuclear Physics. Includes nuclear weapons effects, nuclear radiation effects, shielding and hardening, radiation detection and instrumentation, nuclear reactor materials, and radiation environments in which men, weapons, and equipment are required to operate.

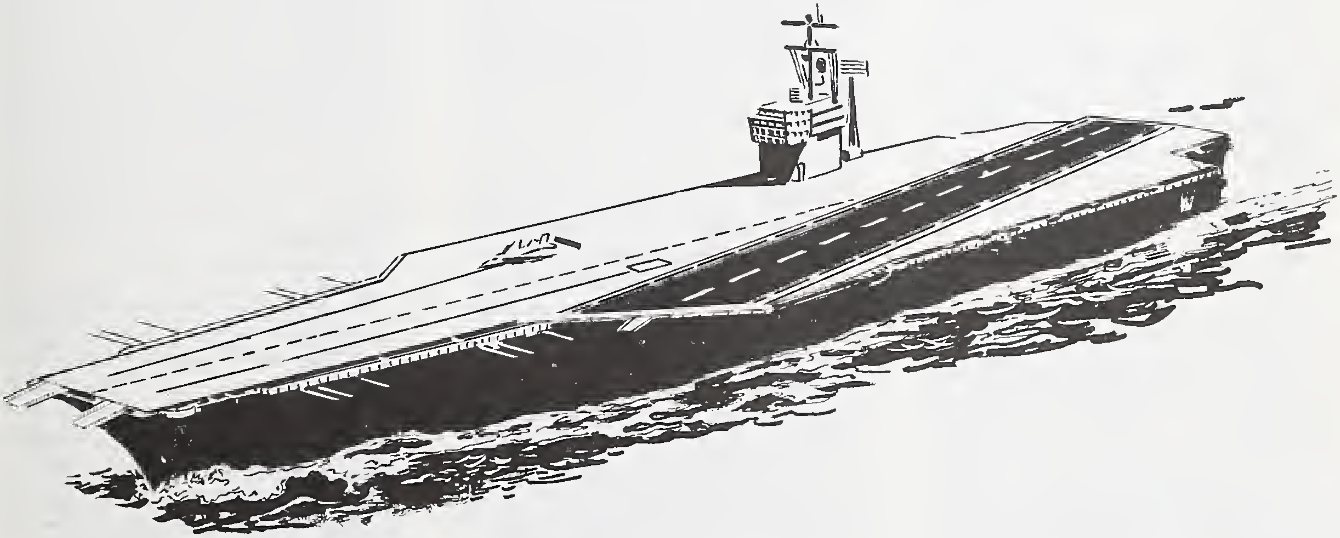
Electronics. Includes electromagnetic-wave propagation, millimeter and microwave devices, circuit and communications theory, surface and solid-state electronics, microelectronics, other novel electronic components, and precision frequency and time techniques.

Metallurgy. Covers physics and chemistry of metals; physical metallurgy; mechanical behavior of solids; imperfections of solids; the liquid state; surface phenomena, corrosion, and deterioration; ceramics and related inorganic and ionic solids; composites; and material for high-temperature, electrical, and electronic applications.

Chemistry. Includes all aspects of modern physical chemistry, with emphasis on the condensed states of matter; chemical synthesis and mechanisms involving new types of chemical bonds; electrochemistry; and chemical materials, with emphasis on the various aspects of polymer science.

Power Program. Supports research related to energy sources and the conversion of potential energy to thrust or electricity. Aims at establishing the chemical and physical limitations on energy sources and at determining how the chemical and physical interactions in propulsion and electrical power generation affect engineering performance. Typical areas of interest are high-energy fuels and oxidizers, chemical energy release processes, jet propulsion processes, magnetohydrodynamics, thermionics, nuclear fusion, and design of machinery for reliability.

Logistics. A research and development program pursued to identify and develop mathematical techniques and algorithms applicable to



problems in naval logistics. Simulation, linear and dynamic programming, regression analysis, and clustering techniques are some of the fields investigated with a view to providing improved tools of inventory management, transportation planning, logistics data processing, and analysis of fleet readiness factors from the material aspect.

Mathematics and Numerical Analysis. Research in mathematics and computation pursued to provide new foundations and tools for naval engineering. Particular emphasis is given to differential and integral equations, especially their application in control theory, optimization, orbital mechanics, wave propagation, mathematical acoustics, and structural and fluid mechanics; to combinatorial analysis and its application in the decision and information sciences; to numerical analysis, including approximation theory and techniques, error analysis, comparison of algorithms, and computational complexity; and to special mathematical aids to computer science, such as automata theory and techniques for large-scale information processing.

Operations Research. Includes mathematical optimization, simulation technology, and mathematical economics. Supporting research tasks selected from the decision sciences include integer and nonlinear programming, large-scale programming, network theory and applications, microeconomic analysis, game theory and its applications, and general purpose simulation. The program emphasizes the innovative applications of operations research techniques to Navy problems, particulary in the general areas of logistics and the management of industrial type activities.

Statistics and Probability. Research areas of current naval interest are stochastic processes as related to level crossing problems, search theory, statistical communications theory, and the analysis of time series to effect detection and classification or discrimination; statistical reliability and quality control; sampling methods; weapon system effectiveness; statistical inventory theory; statistical decision theory; and Bayesian statistical methods. New statistical methodology is constantly sought for application to naval problems.

Information Systems. Research effort is focused on the design of computer science techniques to satisfy the information processing requirements of naval logistics, intelligence, and command and control. Program emphasis is centered around time-sharing management information systems, systems for large-file data processing, systems communication and standardization, and man-machine symbiosis. Specific topics are computer graphics, networks, file organization and structuring, data sharing and protection, compiler design, machine independent software, programming, linguistics, robotics, pattern recognition, computer organization and architecture, hybrid computation, parallel processing, and advanced concepts of data storage and retrieval.

Fluid Dynamics. Fundamental aeromechanics and hydrodynamics are pursued in support of development and improvement of naval aircraft, missiles, ships, submarines, and underwater weapons. Current interests include numerical, analytical and experimental investigations of fluid motions, transonic and hypersonic flows, real gas effects in high-speed flows, fundamental missile and aircraft aerodynamics, viscous flows, turbulence, wakes, jets, cavitation and cavitation damage, supercavitating and ventilated flows, non-Newtonian fluids, drag reduction, ship hydrodynamics, wave phenomena, and gas lubrication.

Structural Mechanics. Provides knowledge needed by structural planners and designers to meet ever increasing performance requirements for modern naval weapons systems. Program encompasses the mechanics of structures, materials, and continua under static, vibratory, and dynamic loadings, with thermal, fluid, and other nonmechanical interactions. Includes research in methods of elastic, plastic, and viscoelastic stress and buckling analysis; constitutive equations reflecting rate sensitivity and cyclic effects; composite materials, including solid propellants; wave propagation, shock, and impact; structural acoustics; fatigue and fracture; experimental techniques; micromechanics; and biomechanics.

Physiology. Sponsors studies of the physiology of nerve function, respiration, circulation, nutrition, and metabolism as related to fatigue and stress (heat and cold effects, high-altitude effects, underwater physiology, and non-ionizing radiation).

Biochemistry. Emphasizes the investigation of certain life processes which affect naval personnel, equipment, and missions, using biochemistry as a tool in the research rather than an end in itself. Fields involved include some aspects of medical biochemistry, biology, immunochemistry, and toxicology.

Microbiology. Involves microbiological processes, including behavior of airborne microorganisms in terms of their physical and biological characteristics, elucidation of the properties of microorganisms responsible for disease in humans, and the effects of environmental factors on the interaction of micro- and macroorganisms with man and his materials.

Medicine and Dentistry. Seeks improved medical support of personnel at duty stations. Research is conducted on the preservation of blood and other tissues for use in mass casualty situations; on shock and resuscitation of the wounded, emphasizing those bearing pulmonary complications; on impact and acceleration injury, directed toward the development of more effective restraint systems for naval aviators; and on dental caries and periodontal diseases for improved control of these conditions in the Navy environment.

Group Psychology. Current investigations are on new concepts of leadership; organizational factors influencing group and individual effectiveness in normal or stressful environments; psychological factors that influence the work performance, social integration, or morale of individuals in groups or organizations; conflict and conflict resolution involving groups, teams, crews, organizations, or other social units, with particular interest in novel approaches to conflict reduction among members of an organization who represent diverse racial, ethnic, and socioeconomic backgrounds.

Physiological Psychology. Research is concerned with psychological, psychophysiological, and neurological factors of perception, motivation, and motor activity involved in human performance in normal and stressful environments. Psychophysical and psychophysiological measures are studied in order to assess attention, perception, cognition, and factors applicable to performance enhancement, especially for conditions found in underwater, flight, and surface operations.

Engineering Psychology. Concerned with assessing man's capabilities as they relate to design and operation of naval equipment and systems. Research aims toward effective integration of men and machines for purposes of interpreting displays, processing information, making decisions, and controlling systems. It also involves development of new methods for evaluating man-machine systems in operational settings, and translation of research results into guidelines for system designers.

Personnel and Training. Aim of research program is to produce technological base essential for development of better methods and techniques of human resources management. Includes fundamental research relating to personnel measurement and factors important to reenlistment decisions, and on-line measurement and diagnosis of training performance.

Aeronautics. Principal interests are air-launched weapons and weapon systems, aircraft design, low-speed and high-speed flight, missile guidance and control, and aircraft control and instrumentation.

Surface and Amphibious. Sponsors investigation of surface-launched weapons and weapon systems, advanced surface-ship and surface-craft concepts, harbor defense, mine warfare and mine countermeasures, amphibious warfare systems, amphibious landing craft, electronic warfare and countermeasures, shipboard machinery and components, mechanical failures, advanced electronic materials and techniques, and items and systems of special interest to Marine Corps.

Undersea Warfare. Includes investigations of underwater weapons; environmental factors, techniques, and exploratory systems for detection, localization, and classification of submarines; advanced subsystems for submarine combat; underwater communications and navigation; noise reduction in ships; and sonar signal processing.

Acoustics. Sponsors studies of fundamental physical acoustics and of the generation, propagation, reception, and processing of underwater acoustic signals.

Naval Analysis. Operations analysis and systems analysis are being used in minimizing the time, effort, and cost involved in applying research results to Navy systems. A program of studies has been designed to provide connecting links between scientific and technological advances and future Navy and Marine Corps systems, with emphasis on lower costs. The program also develops guidelines for research by analysis of future Navy needs.

Air Force Guidelines

Unsolicited proposals suggesting research and development effort to support Air Force needs are evaluated and processed by the Air Force Systems Command (AFSC). If adopted, such proposals must be specially funded. Therefore, it is mandatory that unsolicited proposals be evaluated as offering significant advancement in the present state before consideration for support by the Air Force can be given.

Prior personal contact with Air Force technical personnel, while not required, is permissible and encouraged. Through personal contact an advance opinion can be obtained on all proposed research and development efforts voluntarily suggested by organizations or individuals outside the Air Force. This opinion will provide the submitter guidance prior to the start of any extensive effort in developing a detailed unsolicited proposal. It will also give the submitter assurance that there is a basis for assuming a valid Air Force need for the suggested work.

Proprietary Information

Unsolicited proposals do not necessarily contain proprietary information subject to protection under law. They may nevertheless be unique ideas. Insofar as technical information contained in an unsolicited proposal is concerned, however, if such is in the public domain or cannot be protected under a law as a trade secret or an invention for which a patent is being sought, or has already been issued, the Air Force will not accept liability for failure to safeguard against open disclosure. Unsolicited proposals containing proprietary data should have every paragraph which reveals proprietary data clearly marked, "Proprietary Information," at the beginning and end of each such paragraph.

If an offeror wishes to restrict his proposal, he should mark the title page with the following legend:

> "This data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than to evaluate the proposal; provided, that if a contract is awarded to this offeror as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction is contained in Sheets____."

The offeror shall mark each sheet of data which he wishes to restrict with the following legend:

> "Use or disclosure of proposal data is subject to the restriction on the Title Page of this Proposal."

When and How To Submit

Research and development proposals may be submitted at any time. Organizations and individuals having an idea considered original in nature and concept, and falling within the Air Force areas of interest may submit a preliminary proposal without waiting to be asked.

While no rigid format is specified, elaborate brochures or presentations are definitely not required. The best way to inform AFSC agencies of proposed research and development efforts and to determine if such efforts have a potential usefulness to the Air Force is by letter.

The proposal letter should be accurate, brief, and clear. It is extremely important that a proposal letter be prepared with great care to encourage its reading, facilitate its understanding, and impart an appreciation of the ideas intended to be conveyed. Specifically, a proposal letter should include the following information:

- Name and address of organization.
- Type of organization (profit or non-profit).
- Concise title and abstract of the proposed research and statement indicating that the submission is an unsolicited proposal.
- An outline and discussion of the purpose of the research, the method of attack upon the problem, and the nature of the expected results.
- Name and research experience of the principal investigator.
- A suggestion concerning the proposed starting and completion dates.
- An outline of the proposed budget, including information on equipment, facility, and personnel requirements.
- Names of any Federal agencies receiving the proposal. (This information is *extremely* important.)
- Brief description of organization's facilities, particularly those which would be used in proposed research effort.
- Brief outline of previous work and experience in the field.
- If available, a descriptive brochure and financial statement of organization.

Policy Agreement and Evaluation

AFSC Form 91, "Policy Agreement for Evaluation by the AFSC of Unsolicited Articles, Disclosures, Inventions, and Voluntary Proposals for Contract," is a statement of the terms under which the Air Force Systems Command will accept voluntary unsolicited proposals. This agreement must be signed prior to evaluation by an officer of the company or the individual owning the intellectual property in a voluntary proposal. It is designed for the mutual protection of all concerned and provides protection based on proprietary claims made by submitters of voluntary proposals. No request for special exception or changes in the policy agreement will be granted.

This agreement is executed only once (in duplicate) at the time of initial proposal submission. All subsequent proposal submissions will be covered by the executed policy agreement.

AFSC agencies are responsible for acknowledging receipt of unsolicited proposals. Such proposals will be thoroughly and completely evaluated by appropriate personnel engaged in the technical areas of effort similar to the unsolicited proposal under consideration. Results of the evaluation will be furnished to the submitter.

Authority To Contract

Submitters of unsolicited proposals are advised that only duly constituted contracting officers have authority to contractually bind the Government. AFSC personnel who receive, handle, or evaluate unsolicited proposals are not authorized to commit the Government.

Requests by an evaluator for further information or resubmission after rework shall be at the expense and risk of the submitter, and shall create no obligation on the Government.

The Air Force generally funds only those unsolicited proposals evaluated as offering significant advancement. If an unsolicited proposal is accepted, a contract may be negotiated between the submitting organization and appropriate AFSC activities. Contract details will be discussed and worked out between the submitter and the procurement activity of the AFSC organization concerned.

In the event an unsolicited proposal in not accepted, the Government is not obligated in any way to reimburse the submitter for any costs incurred in submitting the proposal. These conditions are contained in AFSC Form 91 (Policy Agreement).

Where To Submit

Unsolicited proposals should be forwarded directly to the AFSC organization which has responsibility for procurement in the technical area of the proposal being submitted. A list of the AFSC organizations, together with a functional statement for each activity, follows:

Air Force Materials Laboratory
Attn: Sam Bakanauskas (DOY)
Wright-Patterson AFB, Ohio 45433
Phone: (513) 257-1110, Ext. 53635

Conducts research and development in the areas of analytical chemistry, advanced metallurgy, ceramics and graphite, mechanics, coatings, fluids and lubricants, polymers, fibrous materials, plastics, composites, and elastomers.

Air Force Flight Dynamics Laboratory
Attn: Mrs. Carol Brakeall (DOE)
Wright-Patterson AFB, Ohio 45433
Phone (513) 257–1110, Ext. 54316

Plans, formulates and executes Air Force exploratory and advanced development program for aerospace flight vehicle structures, aerodynamics, aerothermodynamics, performance, vehicle dynamics, flight control, recovery and crew station, environmental control, mechanical systems, V/STOL technology, and associated areas including experimental simulation and flight techniques.

Air Force Avionics Laboratory
Attn: Mrs. Clara Benton (DO)
Wright-Patterson AFB, Ohio 45433
Phone: (513) 257–1110, Ext. 55800

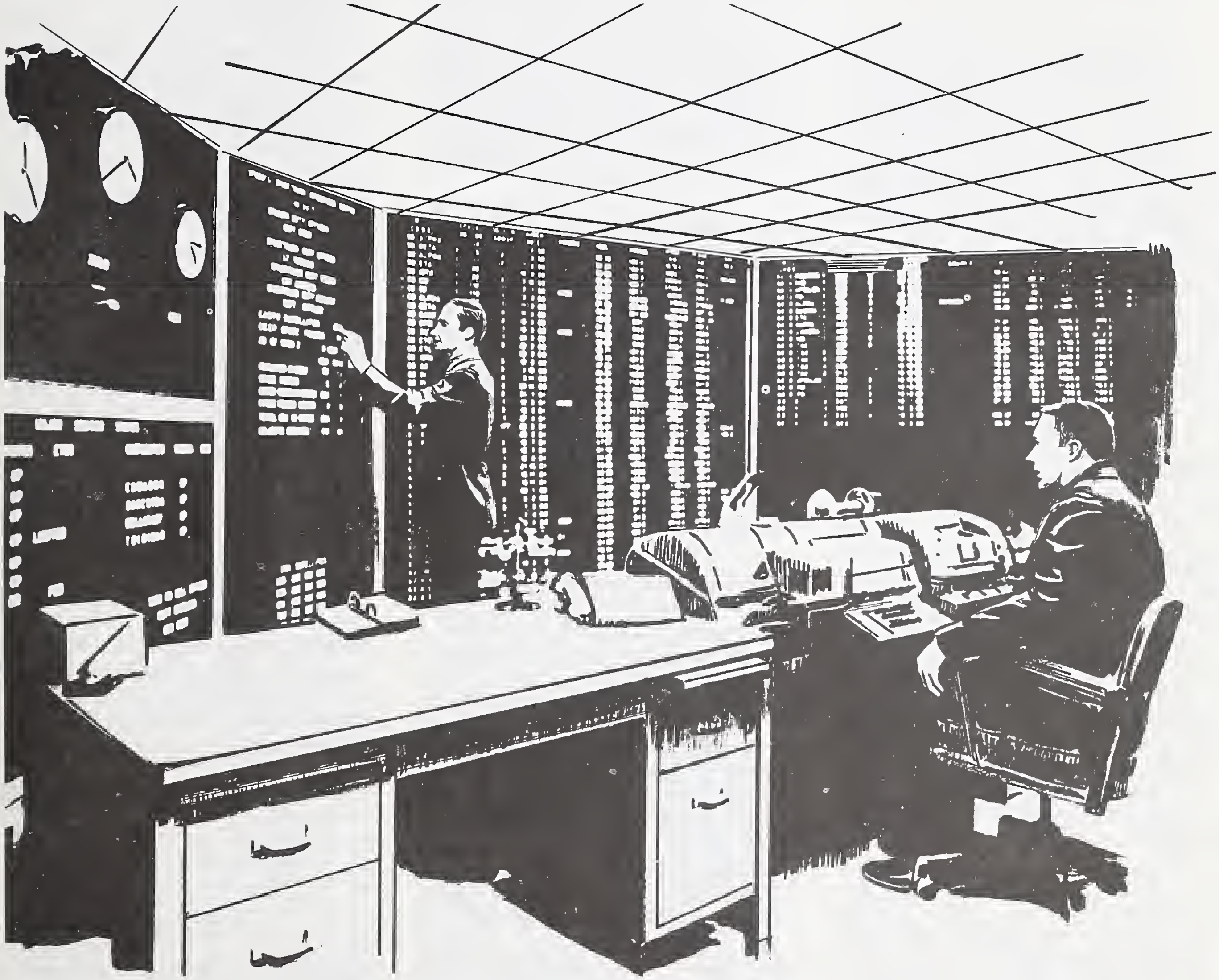
Plans and executes Air Force exploratory and advanced development programs for lasers and molecular electronics; electromagnetic vehicle environment, camouflage, and antennas; electromagnetic warfare; navigation, guidance, and fire control; aerospaceborne reconnaissance, surveillance, and communications.

Air Force Aero-Propulsion Laboratory
Attn: Lawrence McKenny (DOY)
Wright-Patterson AFB, Ohio 45433
Phone: (513) 257–1110, Ext. 53428

Plans and executes Air Force exploratory and advanced development programs in the areas of air breathing, electric, and advanced propulsion; flight vehicle power, fuels, lubricants and hazards.

Air Force Weapons Laboratory
Attn: Lt. David Williams (DOPT)
Kirtland AFB, N.M. 87117
Phone: (505) 247–1711, Ext. 3988

Conducts research and development in nuclear weapons effects, nuclear



weapons ancillary devices, advanced weapons technology, weapon system survivability/vulnerability analyses, nuclear safety, and civil engineering.

Air Force Rocket Propulsion Laboratory
Attn: D. E. Kistler (DOZT)
Edwards AFB, Calif. 93523
Phone: (714) 553-2537, Ext. 32537

Conducts research and development in propellant, combustion, liquid rocket, solid rocket, nuclear rocket, aerospace ground equipment, and rocket propulsion facility technologies.

Rome Air Development Center
Attn: R. Cain (DORP)
Griffiss AFB, N. Y. 13440
Phone: (315) 330-3200, Ext. 3046

Conducts research and development in high-power microwave components, signal detection and processing, computation and display, reliability and maintainability, command and control, instrumentation and test, and associated areas. Primary program areas include data acquisition, processing and presentation; microelectronics; human engineering, intelligence and electronic warfare, comprising research and application of techniques and equipment used in the electromagetic wave spectrum and communication jamming; countermeasures and communications with major interest in the field of data transmission; communications techniques in propagation, detection antennas, and information theory.

Aerospace Research Laboratory
Attn: George Sutermaster (DOJ)
Wright-Patterson AFB, Ohio 45433
Phone: (513) 257-1110, Ext. 53682

Conducts research in physical and engineering sciences which include chemistry, solid state physics, plasma physics, general physics, applied mathematics, metallurgy and ceramics, hypersonic flow, energy conversion, thermomechanics and fluid dynamics.

Air Force Cambridge Research Laboratories
Attn: Mario Liberatore (XOP)
L. G. Hanscom Field
Bedford, Mass. 01730
Phone: (617) 861-3637

Conducts basic research in the environmental, physical and engineering sciences, and assigned exploratory development involving terrestrial, space and atmospheric environments, electromagnetic propagation and plasmas, laser physics, radiation resistant electromagnetic materials, information processing, and antenna theory and design.

Air Force Office of Scientific Research
Attn: Capt. Barry Haas (CCO)
1400 Wilson Blvd.
Arlington, Va. 22209
Phone: (202) 694-5101

Principal AFSC organization for planning, directing, and executing Air Force extramural program designed to ensure availability of and access to new scientific knowledge in those areas of science which offer greatest potential to Air Force's operational capability. Areas of scientific interest include the physical, engineering, environmental, biological, medical, and behavioral-social sciences.

AFSC Foreign Technology Division
Attn: Mrs. L. R. Connally (ACB)
Wright-Patterson AFB, Ohio 45433
Phone: (513) 257-1110, Ext. 72327

Responsible for exposition of foreign innovation from foreign technology, development of detailed understanding of such innovation, and reduction of this understanding to such form as to be of maximum value to research and development of the Defense Department and the United States.

AFSC Aeronautical Systems Division
Attn: Lt. David Abramowitz (XRG)
Wright-Patterson AFB, Ohio 45433
Phone: (513) 257-1110, Ext. 54602

Manages acquisition, including development planning, engineering design, development, test, and inventory production of qualitatively superior aeronautical systems, subsystems, and related equipment. Performs lead division management of limited war, special air warfare, air base defense, aeronautical reconnaissance, and aeronautical electromagnetic warfare.

Air Force Human Resources Laboratory
Attn: Mrs. E. M. Cole (DOJZ)
Brooks AFB, Tex. 78235
Phone: (512) 536-3844

Plans and executes Air Force exploratory and advanced development programs for selection, motivation, training, retention, education, utilization and career development of military personnel; composition of personnel force; and training equipment. Provides technical and management assistance in support of studies, analyses, development planning activities, acquisition, test, evaluation, modification, and operation of aerospace systems and related equipment.

AFSC Aerospace Medical Division
Attn: Major R. L. Woodward (RDO)
Brooks AFB, Tex. 78235
Phone: (512) 536-3681

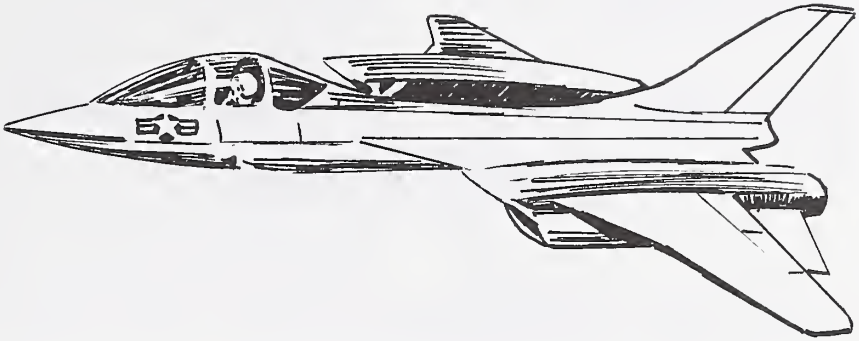
Conducts aerospace medical, behavioral, and bioastronautic research and development and administers specialized educational programs, bioenvironmental health procedures and clinical medicine.

Air Force School of Aerospace Medicine
Attn: Miss C. L. Reynolds (TOPA)
Brooks AFB, Texas 78235
Phone: (512) 536-3577

Conducts research in physiological tolerance and mechanisms, physiological assessments in flight and in simulators, habitable atmospheres, bioregenerative systems, hypogravity states, biological effects of radiation exposure, modification of radiation effects, operational hazards and tolerance, criteria in aerospace environments, biodosimetry; pathophysiological reactions, medical aspects of operational safety, medical implications of B/C operations, preventive and occupational medicine, emergency RX and evacuation; clinical medicine in aerospace operations; medical selection conditioning and maintenance, medical support operation, medical monitoring.

6570th Aerospace Medical Research Laboratory
Attn: E. E. Martin (TO)
Wright-Patterson AFB, Ohio 45433
Phone: (513) 257-1110, Ext. 55214

Conducts research in prediction and control of human behavior, basic mechanisms or selected physicological functions, fundamental biological data, organization and functions of nervous systems; bionics, life support systems, chemoregenerative systems, protective equipment, waste management, nutrition, biomechanics, acceleration; impact, vibration, acoustics, weightlessness; toxicology, individual protection and decontamination in B/C operations; human engineering, training techniques, simulation techniques, unusual environments.



Wilford Hall Air Force Medical Center
Attn: Lt. Col. F. G. Conrad (SGP)
Lackland AFB, Tex. 78236
Phone: (512) 671–7118

Conducts research in clinical investigation, new techniques in medical practice.

AFSC Space and Missile Systems Organization
Attn: Major Eric Kurgas (SYO)
Los Angeles AFS, Calif. 90045
Phone: (213) 643–1766, Ext. 31766

Plans, programs, and manages system programs to acquire qualitatively superior space and missile systems, aerospace ground equipment and other subsystems, and related hardware; provides for activation and alteration of missile sites and ground launch facilities; performs functions of launch, on-orbit tracking, data acquisition, and command and control of DOD satellites; and effects recovery of various space packages.

AFSC Electronic Systems Division
Attn: M.V. Ratynski (TR)
L. G. Hanscom Field
Bedford, Mass. 01730
Phone: (617) 861–3582

Plans for design and acquisition of command and control and communication-electronic systems, range instrumentation, and related equipment and services. System planning and acquisition responsibilities include such selected functional areas as detection, surveillance, identification, threat evaluation and warning, as well as weather and intelligence.

Air Force Eastern Test Range
Attn: Charles Stewart (ENP)
Patrick AFB, Fla. 32925
Phone: (305) 485–4787

Develops, maintains, and operates the range. Responsible for obtaining and coordinating all government and contractor services needed to provide effective support of DOD, NASA, and other agency programs consistent with established national policies and priorities.

Air Force Flight Test Center
Attn: Lt. Col. James Matthes (XOX)
Edwards AFB, Calif. 93523
Phone: (805) 277–2146

Conducts and provides support for tests on aircraft systems, parachutes, and recovery devices; operates Aerospace Research Pilot School; and supports Air Force Rocket Propulsion Laboratory and other testing activities conducted at Edwards AFB.

Armament Development and Test Center
Attn: Harry H. Dillon (DLO)
Eglin AFB, Fla. 32542
Phone: (904) 881–6668, Ext. 882–5345

Responsible for Air Force exploratory, advanced and engineering development programs, test, evaluation and initial acquisition for non-nuclear munitions, related ancillary equipment, weapons effects, ballistics for nuclear and non-nuclear munitions, battlefield illumination, aerospace targetry, and air launched non-nuclear missile technology integration. Conducts and/or supports development testing of weapon systems, electronic systems, armament systems, non-nuclear munitions, CB munitions, ECM/ECCM equipment, targets and scorers, drones, probes, and miscellaneous items.

Air Force Special Weapons Center
Attn: Russell Brown (XOPR)
Kirtland AFB, N. M. 87117
Phone: (505) 247–1711, Ext. 3784

Conducts nuclear weapon compatibility and support equipment testing, aerospace sensor and guidance testing, high-speed track testing, static radar cross-section measurement, drone launch, and miscellaneous flight testing.

Arnold Engineering Development Center
Attn: Dr. H. K. Doetsch (DYR)
Arnold AFS, Tenn. 37389
Phone: (615) 455–2611, Ext. 7834

Conducts systems development tests in ground test facilities such as hypersonic and hypervelocity wind tunnels, chemical rocket and airbreathing propulsion test facilities, space simulation chambers, and aeroballistic and impact ranges. Mission includes continuous updating of present facilities and development of new concepts and technologies for design and construction of new advanced facilities as required. Problems associated with these tasks concern the simulation of atmospheric, orbital and space flight conditions over the complete range of flight envelopes. Problems are encountered in such areas as thermodynamics, gasdynamics, chemistry, general physics, combustion, electronics, instrumentation, electrical power generation, etc., all related to development and operation of aerospace ground test facilities.

Jan. 1, 1972

Changes in Defense Department Contract Financing Policy

Colonel Bruce S. Benefield, USAF

In a comprehensive report to the Industry Advisory Council (IAC) on June 11, 1971, Dr. J. Ronald Fox,* Chairman of the IAC Subcommittee on Contract Financing, recommended significant changes to Defense Department contract financing policy. Dr. Fox and his subcommittee, composed of leaders from the banking community, the accounting profession, and the defense industry, spent over six months carefully reviewing DOD contract financing policy.

While the subcommittee offered a number of recommendations, the three principal ones in the areas of contract financing were:

- Progress payments and costs reimbursed should be based on "cash disbursements" rather than "incurred cost" for the out-of-house portion of the contract, *i.e.*, subcontract, direct material, and other direct contract changes.
- Contractors should receive progress payments and payments on cost type contracts no more frequently than every two weeks.
- On fixed-price type contracts, when profit is paid at delivery, the amount should be based on the latest estimate of the earned contract profit rather than the originally negotiated profit.

Former Deputy Secetary of Defense David Packard concurred with the recommendations offered by the IAC Subcommittee on July 17, and directed the Contract Finance Committee in the Office of the Assistant Secretary of Defense (Installations and Logistics) to take action to implement the new policy. This committee is responsible for the development of uniform policies, procedures and clauses relating to financial matters affecting government contracts. It is composed of a chairman appointed by the Assistant Secretary of Defense (Installations and Logistics) and representatives from the procurement and financial activities of the Army, Navy, Air Force and Defense Supply Agency.

The Contract Finance Committee prepared revisions to Appendix E of the Armed Services Procurement Regulation (ASPR) to reflect the new policy. Defense Procurement Circular No. 94, published Nov. 22, 1971, contains a complete revision of Section 5 of Appendix E, as well as amendments to other sections of Appendix E affected by the change. The new policy will be applied to contract solicitations made after Jan. 1, 1972. Current policy on contract financing will continue to apply to existing defense contracts until they are phased out.

This article will discuss the background of DOD contract financing policy, expand upon the rationale for the three changes recommended by the IAC Subcommittee on Contract Financing, and discuss the effect these changes will have on the defense industry. In the context of this article, contract financing refers to progress payments made under fixed-price type contracts and costs reimbursed under cost type contracts.

Background

The complexity of defense work, the long lead time between the initial production effort and the delivery of the finished item, and the high-dollar value of individual contracts are unique aspects of defense contracting which lead to an unusually high level of work-in-process inventory. To require full financing of these inventories from the private sector would, to say the least, be difficult if not impossible. Consequently, DOD makes progress payments on fixed-price contracts at the rate of 80 percent on incurred costs. In "unusual" cases, this rate can be increased. For small businesses the rate has been set at 85 percent. On cost type contracts, reimbursements are normally made at a rate of 100 percent of incurred costs, less overhead or other cost reserves ef-

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**Dr. J. Ronald Fox was Assistant Secretary of the Army (Installations and Logistics) at the time he served as Chairman of the IAC Subcommittee on Contract Financing. He has since left the Defense Department and is now a member of the Harvard University faculty.*

fected by the DOD contracting officer.

Prior to March 1968, the progress payment rate was 70 percent. However, as a result of recommendations made in December 1967 by a previous IAC working group, the progress payment rate was increased to 80 percent. Other changes in contract financing policy resulting from the recommendations of this IAC working group served to further increase the level of financing provided to contractors. For example:

- The use of progress payments clauses became mandatory on letter contracts.
- On fixed-price incentive contracts, the ceiling for making progress payments was increased from the target price to the ceiling price of the contract.
- Spares and unpriced contract changes were provisionally priced for the purpose of progress payments.
- The Defense Supply Agency was instructed to make progress payments within 10 days after receipt of the requests for progress payment. Previously, payments were averaging 29 days from the date of request for payment.
- Before December 1967, regardless of the negotiated profit rate, 7.3 percent was the maximum profit paid on deliveries made prior to contract completion. The Contract Finance Committee stipulated that on fixed-price type contracts negotiated profit (ranging from 2 percent to 20 percent) should be paid on deliveries which occurred before completion of the contract.

The justification for these changes was that DOD needed speedier action in contract coverage because there had been a slowdown in paperwork due to the then high volume of procurement. The IAC working group also recommended that the contract financing policy be reviewed at least every two years in order to ensure that it was in step with the times.

Rationale for New Policy

One change in DOD contract financing policy to be applied to contracts solicited after Jan. 1, 1972, is to shift to a cash disbursement basis for contractor payment. Under present DOD financing policy applied to existing contracts, progress payments and cost reimbursements are based on accrued costs. It is not unusual for a contractor to accrue a cost and receive payment from DOD before suppliers and subcontractors are actually paid. A prime contractor, who has approved a progress payment to a subcontractor, may also receive 100 percent of that payment from the Government well in advance of his check being issued to the subcontractor. When interest rates are high, the incentive is increased for a prime contractor to delay payment to his subcontractors.

Although under the present policy the standard progress payment rate is 80 percent, the contractor's cash investment in his work-in-process inventory varies inversely with the percentage of his subcontractor business and the "age" of his accounts payable. Therefore, it is virtually impossible for DOD to measure or realistically predict the level of government financing provided to individual contractors. As a matter of fact, a prime contractor who defers payment to his subcontractors may parlay the normal 80-percent progress payment dollars into an amount in excess of 100 percent of his total cash invested in work-in-process. This possibility is, of course, greater on cost type contracts where reimbursements are made at the rate of 100 percent of accrued costs.

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The incurred costs basis for contract financing results in inequities in the level of financing provided contractors, may in some instances encourage delayed payment to subcontractors, and can lead to a level of government financing either close to or above 100 percent of the total cash invested in the work-in-process inventory. In those cases where the Government has provided this level of financing, the contractor has little or none of his own cash invested in the work-in-process inventory, and there is little direct incentive for him to manage this investment efficiently. In situations where the present financing procedures result in a level of financing which exceeds the cash needs of the contract, it is conceivable that the financing could be diverted to other needs.

The New Approach

By basing government payments for out-of-house costs on cash disbursements rather than on accrued costs, DOD has taken a significant step forward in removing inequities in the present system. Of course, it cannot be unequivocally stated that the new approach will completely eliminate delays in prime contractors' payments to subcontractors, but such a policy will certainly eliminate the current advantages of "free cash" which accrue to the prime contractor when he delays his payment to subcontractors and direct material vendors. The shift to a cash disbursement basis will also reduce inequities in the *level* of financing given to prime contractors, as well as provide for a more precise measurement of a contractor's cash investment in his work-in-process inventory. Moreover, it will eliminate other abuses which have occurred in the past and place contract financing on a more rational business basis.

DOD has long recognized that significant financing is necessary to support defense contracts which are characterized by large inventory investments covering long periods of time. DOD will continue to provide financing at the same percentage rates. The shift to a cash disbursement basis for certain aspects of the contractor's costs will result in only a moderate reduction in the level of financing—a reduction which will ensure that each contractor has a visible cash investment in his work-in-process inventory.

Frequency of Payment

Currently, the terms of payment vary from contractor to contractor and reflect positions taken by individual contracting officers or the negotiating power of individual contractors. Some contractors receive payments on a weekly basis, while others are paid monthly. Data from the June 1971 report of the IAC Subcommittee on Contracting Financing reveals that the frequency of government payment varies almost directly with contract size. On larger contracts payments are made more frequently and with less administrative delay than those on the smaller contracts. The IAC Subcommittee noted that, even with the rate of progress payments held constant at 80 percent, variations in payment frequency and the age and extent of prime contractors' accounts payable could result in significant inequities in the level of financing provided by the Defense Department.

To reduce these inequities, on all new contract solicitations after Jan. 1, 1972, DOD will make contractor payments no more frequently than every two weeks.

Liquidation—Fixed-Price Contracts

Many progress payments are currently liquidated under the alternate liquidation method as deliveries are made. Under this form of liquidation, the contractor not only is reimbursed for the remainder of his costs, *i.e.*, those not previously financed by progress payments, but also receives a portion of his profit. The rate at which progress payments outstanding are liquidated under the alternate method allows the contractor to receive all of his costs and the pro-rated portion of the *negotiated* profit. Because actual profits earned on defense contracts frequently are very different from the negotiated profit levels, a number of DOD studies have revealed that the alternative liquidation method can result in an interim overpayment or underpayment, depending on the profit actually earned. When the proper level of contractor profit eventually becomes known, the Government must compensate by raising or lowering future liquidation rates —an administratively burdensome task.

Under the new ASPR revision issued by the Contract Finance Committee, on all contract solicitations after Jan. 1, 1972, DOD will avoid these administrative difficulties by requiring that, prior to the first delivery, the contractor submit cost and profit data on which to base the liquidation rate. Thus the alternate liquidation method will be based on a more realistic profit estimate, rather than the negotiated profit rate. The Contract Finance Committee believes that such a policy will be more equitable to both DOD and the contractor. In those cases where the contractor is earning a profit above the negotiated level, his payments at the time of delivery will be increased. In those cases where he is actually earning profits less than the negotiated level, under the new policy he will receive a payment reflecting his actual profit at delivery.

Effect of Policy Change

Since contractors normally keep their books on an accrual basis, the new policy of making payments based on cash expended will require some accounting changes. It has been concluded, however, that the necessary accounting changes can be made and will neither be unnecessarily complex nor costly. Only direct material purchases, subcontractor deliveries, and progress payments to subcontractors will be financed on a cash disbursement basis. The remainder of a contractor's costs will continue to be financed on an accrual basis. To accommodate the contract financing policy change, it will be necessary for contractors to code and accumulate the costs associated with accounts payable by contract. Hence, in many cases, a one-time change in programming will be required to produce a revised computer printout.

Small business will continue to be reimbursed for its costs on the present accrual basis.

DOD policy changes effective Jan. 1, 1972, moderately decrease the level of contract financing provided defense contractors. As a result, defense contractors will be less dependent on the Defense Department for financing, and will rely on commercial lending institutions for a larger share of the financing burden. Since the contract financing changes will only be effective on contracts solicited after Jan. 1, 1972, reduction in government financing will take effect gradually over a four-year period as the existing contracts are phased out and new ones are awarded. The IAC Subcommittee has estimated that the changes in contract financing policy will create the need for an additional $700 million in commercial financing.

The cost of money is not an "allowable" cost under the cost principles of ASPR, and current DOD profit policy does not recognize contractor investment. Therefore, unless DOD reimburses contractors for the reduction in contract financing, earned profit levels will decrease. Until DOD profit policy adequately recognizes contractor investment, DOD will adjust for the reduction in the level of contract financing. A contract financing factor is now being developed for implementation with the changes in contract financng policy on Jan. 1, 1972.

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Should Cost Technique

Budget Squeeze Necessitates Stretching the DOD Dollar

First Lieutenant Robert Seiwert, USA

Since the decade of the 1960s, the Defense Department has been under severe criticism because of the escalating cost of military procurements. While the cost of defense has increased, our source of funds has decreased. Domestic needs have severely cut into the defense budget. According to the Secretary of Defense, this year's ". . . budget represents a leveling off at just $200 million (dollars) more than FY-64 spending levels and comes after a FY-68–72 total chop in defense spending of $23.9 billion (dollars). Interestingly enough . . . in the same . . . period, other federal spending will have gone up $36.4 billion (dollars), state and local government spending will be up some $29 billion (dollars)."[1]

Thus the defense budget is caught in a squeeze. Inflation, cost growths, and the need for sophisticated weapon systems have increased the cost of defense, while the need to cure "domestic ills" has decreased the dollars available for defense. Because of this situation, the procurement environment has changed significantly. Agencies within the Defense Department are paying increasing attention to the cost of weapon systems in addition to stressing the need for quality products delivered on schedule.

In order to stretch the defense procurement dollar, the Department of the Army has implemented a four-part program to control cost growth. Dr. J. Ronald Fox, former Assistant Secretary of the Army (Installations and Logistics), explained this four-part program early in 1971:

"*Part One* calls for the establishment of a clear and reasonable cost baseline during contract negotiations. We are seeking to accomplish this action by competitive procurements and by the use of the 'should cost' negotiating technique.

"*Part Two* calls for substantial changes in government and industry control systems so as to be able to identify deviations from plan at a time early enough in the development of a problem, so that one can examine alternative courses of action other than simply finding additional funds or making drastic reductions in the program. [This is being accomplished by requiring application of the provisions of DOD Instruction 7000.2, "Performance Measurements for Selected Acquisitions," to major weapon system programs.]

"*Part Three* of this course of action requires that we establish barriers that will make it very difficult to add tasks to a project or to change requirements once the initial program has been approved and the contract is written. [This is being accomplished by the establishment of configuration control boards under each of the Army's major weapon system program managers.]

"*Part Four* of this course of action requires that the government maintain viable alternatives wherever possible and use the mechanism of cancelling a contract for default when a contractor does not perform according to the terms of the contract. As long as the contractor . . . believes that there is a ready opportunity to get well on contract changes or be able to obtain agreement on reductions in performance requirements, all methods of control are likely to fail."[2]

Should Cost Concept

Part one of the Army's program to control cost growth calls for the establishment of a "clear and reasonable" cost baseline. This is expected to be accomplished by increasing both the number and the dollar value of competitive procurements and by application of the should cost negotiating technique.

The should cost concept began in the civilian economy. For example, a large nationwide consumer goods chain has used the technique for many years. Use of the technique has enabled this commercial organization to obtain fair and reasonable prices from its suppliers of appliances, hard goods, and other items. It has encouraged its suppliers to constantly search for more efficient ways to manufacture their products to retain the sizeable orders of the retail chain.

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[1] *Government Executive, April 1971, p. 39.*

[2] *Statement before Department of Defense Subcommittee on Appropriations, U.S. Senate, First Session, 92nd Congress.*

In late 1967, the Defense Department was concerned over the high price of the TF–30 jet engine for the F–111B. Gordon Rule, Chief of the Naval Procurement Clearance Division, Naval Material Command, was assigned the task of conducting the first of what is now called a should cost analysis. The results were significant and demonstrated to the Army the usefulness of the technique, both for lowering costs on the "instant" contract and for accomplishing long-range improvements in contractor operations.

What is "should cost"?

Basically, it is an approach to the pricing of hardware that the Military Services buy from industry which assures that a contractor's projections do not include the cost effect of past inefficient or uneconomical management practices. The should cost technique, of course, is an adjunct to cost analysis which the Armed Services Procurement Regulation (ASPR), paragraph 3–807.2(c), defines as ". . . the review and evaluation of a contractor's cost or pricing data and of the judgmental factors applied in projecting from the data to the estimated costs, in order to form an opinion on the degree to which the contractor's proposed costs represent what performance of the contract should cost, assuming reasonable economy and efficiency."

Should cost differs from traditional pricing principally in two respects:

- Depth of the analysis.
- Extent to which the Government challenges inefficiencies in the contractor's operation.

Traditional pricing effort is based largely on projections of historical cost data. When past operations have been inefficient, such projections of cost data thereby have an automatic "built-in" factor to cover the cost of continued inefficiency. By "scrubbing" these inefficient practices from a contractor's proposal, the Army is assured that the negotiated price reflects only those costs which would be incurred under conditions of economy and efficiency of operations.

The product of a should cost analysis is the establishment of a negotiation objective—a price at which the contractor *can* produce if he operates with reasonable economy and efficiency. It is not a "rock bottom" figure at which the contractor "could" conceivably produce the product if he drastically changed his operations. The Army does not seek to tell a contractor how to run his business. It does, however, have a commitment to the American taxpayer not to pay for inefficient practices in the procurement of major weapon systems.

To perform such an analysis, a team of Army specialists who possess expertise in design engineering, industrial engineering, accounting, and management is organized. The team conducts an in-depth analysis of a contractor's:

- Direct labor standards.
- Cost allocation methods.
- Unit standard material costs.
- Plant utilization and plant layout.
- Indirect factory expense.
- Make or buy program.
- Purchasing procedures and practices.
- Vendor and special tooling allocations.

Deficiencies in these areas will be pointed out to the contractor's top management during the negotiation process. At that time the Army will request the contractor to begin a specific management improvement program to reduce the cost impact of current inefficient practices. While the negotiated contract price will reflect the cost effect of those changes which can immediately be initiated, the full benefit of a should cost analysis is not realized until the contractor corrects the areas of deficiency itemized in the management improvement program.

Application to Army Procurements

The Army, realizing the potential of the should cost technique, has established a program to aggressively pursue and expand its use on major procurements. Generally, use of this cost analysis technique is limited to contractors who:

- Have a preponderance of their business with the Government.
- Are sole source in this procurement.
- Have the possibility of follow-on contracts.
- Have a history of rising costs.
- Produce a major on-going system for the Army.

Experience has shown that the should cost technique is most useful to the Government and the contractor when these conditions are prevalent. However, it would be incorrect to assume that a should cost analysis will be performed only when the aforementioned conditions exist. Other situations may dictate the necessity of a should cost analysis. Also, more than one should cost analysis may be conducted on a particular contractor's operations.

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It is important to note that, if major defense weapon systems could be obtained from a truly competitive market, cost analyses would not be necessary. In a truly competitive environment ". . . prices are determined by competition, not by the cost incurred or a 'fair' level of profit. Those sellers with better than average performance in reducing costs or anticipating consumer desires receive an above-average return while those with poorer than average performance lose money and eventually leave the market."[3]

Unfortunately, such a market mechanism exists only to a limited degree in the defense industry. ". . . The price of a weapon system is not determined by reimbursement of costs actually experienced, plus a fee bargained for in advance. This is most obvious in the case of cost plus fixed-fee contracts but in practice the prices on other types of weapons contracts are based largely upon the contractor's actual or anticipated costs rather than a market price."[4] The Army feels that the should cost approach helps to introduce the necessary force into a non-competitive procurement to achieve a competitive type price.

Objectives of Should Cost

What does the Army hope to accomplish by performing a should cost analysis on a contractor's operations?

The first objective is to establish a government negotiation position. Again, it is emphasized that the should cost figure is not one which is attainable, but one which reflects the dollar effect of achievable economies and efficiencies.

The second objective is to assist the contractor in becoming more efficient. This benefits not only the Government, but the company as well since it improves the contractor's competitiveness. To accomplish this goal, a commitment is obtained from the contractor's top management to correct specific inefficient practices. Benefits to the taxpayer of the management improvement program will in the long run far outweigh any savings accrued in the instant contract. Specific areas directed to the contractor's attention resulting from should cost analyses already conducted by the Army are the need to:

- Improve or establish direct labor standards.
- Improve labor efficiency.
- Reduce scrap.
- Reduce overhead.
- Improve a make or buy system.
- Improve plant layout.

Results of Should Cost Studies

To date, the Army has completed 10 should cost studies, has 5 in progress, and has a number in planning stages. Results of the completed studies are quite encouraging. The Army Materiel Command estimates it has reduced contract award prices by over $54 million. Of this total, $30.4 million can be directly attributed to the should cost effort. Greater savings have been attained at the negotiation table because the should cost approach brought together into one team a group of highly talented procurement specialists. By allowing these specialists to work as a coordinated team, the Army has improved the analysis of a contractor's proposal.

An example should illustrate the potential of such an approach. During one Army should cost study, a contractor proposed to fabricate an integrated circuit which could have been purchased on the outside market at a considerable savings. Industrial and design engineers on the analysis team noted that, although the requirement was a complex technical issue, it could be met by various integrated circuit suppliers. By requiring the contractor to obtain competitive quotes, the Army was able to reduce the contract award price by over $500,000.

In addition to surfacing the need to improve make or buy procedures, should cost analyses have produced findings such as contractors overstating labor, failing to use price competition in procurement of material, lacking an effective production planning and control system, using higher caliber quality engineering talent than could be justified by the contract, and being content with a low labor realization factor.

There are two areas of deficiency which continually recur in both the Army's analyses and those conducted by the General Accounting Office (GAO):

- Failure to establish an effective production planning and control system.
- Failure to use pricing competition in the procurement of material.

In the area of production planning and control, a recent GAO report ". . . found that one contractor's production control system was in need of improvement because:

—the manufacturing schedule did not include provisions for all parts which were to be manufactured,

—manufacturing start and finish dates had not been established for parts included on the schedule,

—utilization of production equipment was not scheduled to make the most efficient use of available machines,

—economic lot sizes had not been established for the manufacture of all parts, and

—reported machine set up time exceeded the allowable by over 100 percent.

"This condition had been recognized by the cognizant Government plant representatives as early as March 1967, but no action was taken to request the contractor to establish a completely integrated production control system or to monitor the contractor's efforts in this area. When we [GAO] brought our [its] observations to the attention of contractor officials, they agreed that their production control system should be improved and advised us that a group had been formed in October 1969 to implement an improvement program. On the basis of current levels of production, an investment of about $580,000 to design and implement an effective production control system could result in estimated annual savings of about $3.1 million. These savings will result from the elimination of about 139 indirect labor positions in the material production control department and the reduction of about 10 percent of

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[3] *Peck, Merton J., "The Weapon Acquisition Process: An Economic Analysis," pp. 55–56.*

[4] *Id., p. 57.*

DCAS "Sells" and "Services" Value Engineering Program

Charles S. Hotchkiss

Salvatore Castiglioni

The role of the Defense Contract Administration Services (DCAS) of the Defense Supply Agency in the DOD Value Engineering Program is primarily oriented toward motivational and assistance actions. As with a commercial product, a marketing effort is required to "sell" a government program to potential users. Once sold, an effort must be made to "service" the program, to assist users in resolving difficulties in its application. This is the role of DCAS in the DOD Value Engineering Program. DCAS "sells" the program to defense contractors and then "services" what it has sold.

DCAS, realizing the vast potential of this program, has been making a concerted effort to indoctrinate contractors in all aspects of value engineering as it relates to DOD procurements. The object of this effort is to stimulate maximum interest in submission of good quality value proposals by contractors.

Program direction and guidance from DCAS headquarters is disseminated nationwide through three multi-regional value engineers (MRVEs) physically located at DCAS regional headquarters in New York, Chicago, and Los Angeles. The multi-regional value engineers provide technical direction, guidance, and assistance to the DCAS regions (DCASRs) for which they have responsibility through production staff engineers, who then provide this guidance and direction to production engineers, industrial specialists, and other DCASR personnel who are in daily contact with defense contractors. The East Coast MRVE provides this service for DCASRs New York, Boston, Philadelphia, and Atlanta. DCASRs Chicago, Detroit, Cleveland and St. Louis are serviced by the Central MRVE, while the West Coast MRVE, located at DCASR, Los Angeles, is responsible for that region, plus San Francisco and Dallas.

Value Engineering Contract Clauses

DCAS value engineering activity is guided by provisions of the Armed Services Procurement Regulation (ASPR). Section 1, Part 17, of the ASPR contains basic guidelines for all contractual value engineering within DOD. It explains in detail the specifics and applicability of the value engineering contract clauses used and the arrangements through which savings are shared with defense contractors.

There are two value engineering clauses used in DOD contracts: Incentive and Program Requirement.

The *Incentive* clause, which is the most frequently used, does not require any action by the contractor unless he chooses to participate in the program. It permits the contractor to share in cost reduction savings he proposes in accordance with the clause, and explains the arrangement whereby these savings will be shared.

The *Program Requirement* clause requires a stipulated level of value engineering effort on the contract for which the contractor will be compensated, in addition to sharing in savings generated by this effort. Specific guidance and format for submitting cost reduction proposals, known as Value Engineering Change Proposals (VECPs), are provided in MIL–STD 480 and MIL–STD 481.

DCASR Procedure

What happens when a contract containing value engineering provisions has been awarded to a defense contractor?

If the contract containing these provisions is assigned to DCAS for administration, the production engineering element of the responsible DCAS office is alerted. Value engineering responsibility is then assigned to an engineer who thoroughly familiarizes himself with the value engineering provisions of the contract.

Based on knowledge of the contractor, his past experience with value engineering, the type of value engineering clause or clauses in the contract —Incentive and/or Program Requirement—and other criteria employed by the cognizant DCAS office, the engineer determines the necessity for an immediate visit to the contractor's plant. During the plant visit, the

DCASR representative explains in detail the DOD Value Engineering Program, the particulars of the value engineering contract clause, the preparation and processing of VECPs, and answers any questions the contractor may have.

If the value engineering contractual provision is a Program Requirement clause (a line item in the contract which requires a stipulated level of value engineering effort), then additional surveillance visits to the contractor's facility are scheduled. These visits are in accordance with the DCAS responsibility to assure adherence to value engineering contractual provisions.

Processing VECPs

If motivational efforts have been successful, then additional DCAS services are required as the contractor's value engineering efforts materialize in the form of VECPs. The Armed Services Procurement Regulation requires a contractor to submit his proposals to the procuring contracting officer with a complete copy to the administrative contracting officer. For contracts administered by DCAS, the administrative contracting officer is located either in a DCAS regional, district, or area/plant office.

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When the administrative contracting officer receives his copy of a VECP, he immediately forwards it to the DCAS production engineering element for an "on-site" technical evaluation. This evaluation, usually prepared by a production engineer, includes an analysis of the effect of the proposal on contract price, producibility, and delivery schedule. If packaging or transportation would be affected by the change, an evaluation is requested by the engineer from the DCAS packaging or transportation specialists. If testing or contractually required technical data would be affected, an evaluation is requested from the DCAS quality engineering group. The production engineer then compiles the DCAS evaluation which includes a recommendation for approval or disapproval.

While all of this is happening, the procuring contracting officer has also requested a technical evaluation from the cognizant technical procuring agency, which evaluates the proposal from a "system" standpoint. The technical agency, of course, has input from field users of the involved materiel and provides input to a configuration control board.

The recommendations of the technical agency, the configuration control group, and DCAS form the basis for the procuring contracting officer to accept or reject the contractor's VECP. Since DCAS assists both the contractor and the buying agency in value engineering matters, DCAS becomes a catalyst, effectively contributing to the implementation of the DOD contractual Value Engineering Program.

Having given the contractor submitting a VECP guidance and assistance, and having interfaced between the contractor and the approving agency, DCAS is interested in seeing that a fair and rapid response is received by the contractor. Therefore, the DCAS production engineer, working through the administrative contracting officer, will follow up with the buying agency on a monthly basis until the proposal is acted upon. If a proposal is rejected, the same engineer will review the rejection letter to see that it is responsive to the proposal. Usually, he will review the rejection with the contractor, discussing whether to resubmit or retire the proposal.

Program Benefits

The application of value engineering techniques has produced considerable savings to DOD. These savings have, in general, increased year by year and represent creation of assets that may be used by DOD program managers for additional development, production, or support. All savings reported under the program are audit-validated. Included in the figures are those savings to DOD that occur from contractor-submitted proposals. As more contractors realized the benefits of the program to them, the dollar

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value of accepted contractor proposals to DOD steadily increased from $13 million in FY 1968 to $94.8 million in FY 1971. The total number of proposals processed by DCAS in FY 1967 was 530; in FY 1968, 718; in FY 1969, 972; in FY 1970, 1,238; and in FY 1971, 1,229.

The DCAS headquarters staff, the multi-regional value engineers, the regional production staff engineers and the individual production engineers, industrial specialists, quality assurance representatives and other DCAS personnel are available to answer specific questions or provide information on the subject. However, the three multi-regional value engineers or the DCASR production staff engineers will be able to provide the quickest response to inquiries.

DCAS will continue to promote the DOD Value Engineering Program to the maximum degree possible. In addition to direct contact with contractors having active contracts, DCAS sponsors and participates in seminars, symposia, and workshops to expand knowledge in the value engineering concept. Savings resulting from value engineering efforts and shared by the Government and defense contractors have increased each year since the inception of the program in 1964. Greater emphasis and participation by both parties will undoubtedly increase savings beneficial to both industry and Government.

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Value Engineering Guide, Value Engineering Field Staff, DSA CAS, December 1970.

Value Engineering Guide—Preparation and Processing, Value Engineering Field Staff, DSA CAS, November 1970.

DOD Handbook 5010.8H, Value Engineering, Sept. 12, 1968.

Copies of the DSA publications and the DOD Handbook may be obtained from multi-regional value engineers or production staff engineers at the Defense Contract Administration Services Regions.

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Value Engineering

An Approach to Lowest Cost, Improved Long-Term Profit

Bernard H. Hewitt

The motivation of any business organization is reward and potential growth. A means for realizing such rewards and growth in terms of receiving future contracts from the Defense Department is an understanding of and participation in the DOD Value Engineering (VE) Program.

To understand value engineering, it is imperative that three vital points be known:

- What is value engineering?
- How is it achieved?
- Why should value engineering be achieved?

Value engineering is not an engineering specialty, but an engineering approach to maintaining value at the lowest possible cost. It is a means of improving long-term profits and reducing operating costs. Value engineering can be defined as a systematic, planned approach, making use of the best available tools of science, engineering (including production engineering), and industrial management, to obtain the necessary function at the least cost of ownership. The total effectiveness of value engineering is measurable in a reduction of initial and maintenance costs through gains in reliability, maintainability, production, quality and logistic support, which results in increased "military worth" to DOD. It means the total efforts of contractors, subcontractors, consultants and advisors, and the inclusion of the latest specialty products and processes.

All these things must be interrelated with the DOD requisites to effect a catalytic effort which accelerates the value learning curves on all products and permits advances of five or more years through induction of better methods and materials into end items to obtain the necessary functions. The contractor is often in the best position to determine better materials, means, or methods of manufacturing a specialized part, assembly, or end item.

Additionally, it must be remembered that the value engineering approach can and should be used in the "software" areas, which also contribute to cost. Contractor participation in value engineering through submission of Value Engineering Change Proposals (VECPs) under the Value Engineering Incentive or Program clauses, which are contained in defense contracts as prescribed in the Armed Services Procurement Regulation (ASPR), is encouraged by DOD. The function of the part, assembly, end item, or software item should be retained at less cost unless, after analysis, it has been determined that the function is unnecessary and the part or item can then be eliminated.

DOD encouragement under the Value Engineering Incentive clause has been effected by establishing criteria for fair sharing of the savings by the contractor. This was considered to be necessary because of the contractor's financial investment in a voluntary effort. Change 3 to the ASPR states that it is intended that the rule, rather than the exception, concerning contractor sharing be: (1) that the instant sharing will be at

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least 50 percent and (2) that royalty and collateral sharing provisions will be included in appropriate contracts. In order to attain these fair sharing objectives, the individual in charge of the purchasing office should include these types of sharing provisions when a value engineering sharing potential exists. All VECPs submitted for consideration should be thoroughly documented so that decisions on economic and technical aspects can be expeditiously processed.

Under the Value Engineering Program contract clause, DOD pays the contractor to perform value engineering on the item(s) under contract, directs and monitors his efforts, and allows him to share in the savings, but to a lesser degree than under the Value Engineering Incentive clause. If the contractor can maintain the function of the part, assembly, or end item, and simultaneously reduce costs based upon superior knowledge of business and manufacturing operations, then he has created a higher value for the end product. This is the key to value engineering.

How To Achieve VE

A contractor's methods, price, and prior contract performance are the primary reasons for receiving a DOD contract. A contractor's value engineering participation and demonstrated capability in manufacturing a specific part, assembly, or end item for less cost, while retaining necessary performance characteristics, should create a more desirable factor for consideration of contract award in the current atmosphere of budget restraints. The contractor should determine the item function and parameters of operation, so that he can realistically and effectively appraise alternate designs; other methods of manufacturing, casting, machining, or assembly; or suggest specification changes that will reduce costs while maintaining the necessary function without degradation in the quality, reliability, maintainability, and other attributes of military worth.

When a contractor has specific suggestions that meet these standards, he should submit his ideas as VECPs to the cognizant contract administrator, who will forward the VECP through channels for technical test and evaluation. If results are favorable, an eventual contractual change will be made to effect reduction in monetary obligation.

Why Achieve VE

In today's highly competitive defense business, DOD procurement agencies are demanding increased, active, and fruitful efforts toward reducing costs. While products are becoming more complex and expensive, value engineering has become an active program dedicated to enabling the contractor to compete effectively for new business.

The strongest motivating factor for the part played by the contractor in achieving value engineering is the desire for a greatly improved competitive position in the future, which ultimately will lead to increased business and higher profits. The money received as a share of the savings resulting from an approved VECP under the purview of the Armed Services Procurement Regulation is not subject to renegotiation as excess profits under the Renegotiation Act, but is considered to be a payment for services rendered.

Opportunities for value engineering effort are practically unlimited, and can be applied in areas other than those indicated by the following checklist:

- Can a standard part be used?
- Would a modified standard part be more economical?
- Are newly developed materials available?
- Are all machined surfaces necessary?
- Will the design allow standard test equipment to be used?
- Are tolerances closer than needed?
- Can certain tests be combined or eliminated?
- Can certain technical progress reports be combined or eliminated?

An understanding of the objectives of the Value Engineering Incentive and Program contractual clauses can be obtained through such areas as local colleges, the Air Force Institute of Technology (School of Systems and Logistics) at Wright-Patterson AFB, Ohio, and the three major Defense Contract Administration Services Regional Offices in New York, Chicago and Los Angeles.

The Government and industry can both realize benefits by aggressive application of value engineering methodology. Through effective value engineering effort, the Defense Department obtains necessary operational capability at less cost and the contractor achieves profit and growth.

Army Has Test Measurement Diagnostic Equipment File

For companies with government contracts, the Army's Test Measurement Diagnostic Equipment (TMDE) register is a valuable source document. Comprised of a set of microfiche cards of technical data on nearly 2,800 pieces of TMDE, it is the sole source listing of all TMDE either proposed, under development, or in use by the Army.

Army Materiel Command's TMDE Technical Coordinating Office at Army Weapons Command, Rock Island Arsenal, Ill., is responsible for compiling and maintaining the register.

TMDE is used primarily to evaluate the operational condition of a system and to isolate any malfunction in either the equipment or the system itself. Current TMDE policy is to use existing or modified TMDE unless it cannot fill a new requirement.

One advantage of the register is that Army project managers who are developing TMDE need not expend development funds for equipment in existence or under development. Volumes I and III of the register list new development ideas and equipment.

The TMDE coordination office at Weapons Command assists design engineers, project and production managers, and research and development personnel. This office monitors the overall TMDE program and provides technical coordination among Army Materiel Command research activities and subordinate commands, and industry.

The Technology Coordination Paper: A New Look at the Technology Base

Dr. Gus D. Dorough Jr.
Captain Gordon H. Smith, USN

Partly as a result of experiences in Southeast Asia, partly as a result of curtailed budgets and other factors, the entire process of weapon acquisition is being critically examined and overhauled. A better product at a lower lifetime cost is the objective—an objective of vital importance to our future national security.

The foundation of all U.S. weapon system development is a large "technology base" supported primarily by the Defense Department but with important elements coming from the Atomic Energy Commission and the National Aeronautics and Space Administration. Many new weapon concepts originate in this base, and the progression from idea to weapon always involves the base in various ways. It is the principal asset from which DOD derives its options for new armament capabilities.

This technology base is characterized by breadth, complexity, and constant change. It encompasses virtually all aspects of the physical, biomedical, and environmental sciences, plus most of the behavioral sciences and the engineering disciplines. The DOD portion of this base is implemented by perhaps a hundred offices and organizations in the Military Services and Defense Agencies, and the work is executed in several hundred principal laboratories and institutions in the United States. It is comprised of more than 16,000 task-oriented work units ranging in cost from $20,000 to several hundred thousand dollars each. In the aggregate they total an annual expenditure of approximately $1.5 billion, or almost one-fifth of the research, development, test, and evaluation (RDT&E) budget.

Overall cognizance of the RDT&E budget in DOD is, of course, assigned to the Director, Defense Research and Engineering. In this capacity, he is responsible to the Secretary of Defense and, ultimately, to the Congress for verification that RDT&E funds are spent wisely and well, and that they are properly coupled to the legitimate needs of the Defense Department. The task of giving this verification and assurance for the technology base is assigned directly to the Deputy Director for Research and Advanced Technology.

Each Military Service has the clear-cut responsibility to manage its share of the technology base and to direct it toward the support of its own mission. The Deputy Director for Research and Advanced Technology and his small staff of technical experts serve in a "board of directors" role to establish overall DOD policy for technology base activities, and to review on-going and planned work within the base. The relationship between the Deputy Director for Research and Advanced Technology and the Military Services is interactive and cooperative. Most of the interaction is rather *ad hoc* in nature, involving queries, visits, discussions, and reviews on specific budgetary and technical aspects of technology base programs.

These interactive activities are both valuable and necessary. However, something more is needed to give a clear overview of technology base activities. Are there needless overlaps and duplications? Are there vital defense research areas which are underfunded and even missing from the base? Are sufficient coordination and interchange taking place among the Services to maximize the capabilities being applied to a given area? Are the priorities set correctly, *i.e.*, are the spending levels for the various areas consistent with the requirements for those areas? Are future weapon system requirements being properly acknowledged in the more applied work being conducted within the technology base?

These are the kind of questions which concern both the Director of Defense Research and Engineering and the Assistant Secretaries for Research and Development of the Military Departments who are responsible for overseeing the Service programs. In addition, the Secretary of Defense and the Congress have their questions concerning the relative value of all the diverse activities contained in the base, questions which are only properly answered by showing how the various pieces fit together to make a coherent whole.

A New Management Technique

About two years ago, a new and more systematic management technique was introduced by the Director of Defense Research and Engineering to provide the needed overview. This technique is the compilation of Technology Coordination Papers (TCPs) to provide both a concise summary and an analysis of selected technical and scientific areas within the technology base. The TCP is solely a management device for internal use by DOD managers and decision makers. It is intended to define:

- Specific scientific and engineering advances needed to meet future military requirements and to solve current problems.
- Programs under way or planned by each Service to fill these needs.
- Important gaps in the technology, if any, which exist at presently projected funding levels.
- Ways in which the technology area can be strengthened. (These are recommendations from the "field" for consideration by management.)

The TCP is an evolving concept, subject to improvement as experience gained from its implementation to date is applied to new TCPs or to the revision of older ones. To begin with, a large but reasonably bounded technological or scientific area is chosen as the subject for a TCP. A team, under the leadership of a staff member of the Office of the Deputy Director for Research and Advanced Technology is selected to prepare the TCP. While the composition of the selected team is a function of the specific technical area, it will include, for most TCPs, representatives from the staffs of the headquarters, the "systems" commands, and the laboratories of each of the Military Services. Additionally, representatives of appropriate Defense Agencies, such as the Advanced Research Projects Agency, Defense Nuclear Agency, etc., are included. Where possible, technical planning papers prepared by the Military Services for internal planning purposes are used as contributions to the TCP. Personnel who prepared the Service technical planning papers serve as members of the TCP team. This expedient saves effort on the part of the Service, and provides a ready opportunity for planners in one Service to become familiar with the efforts of the other Services in the technological area covered by the TCP.

The first step in actually producing the TCP is one of deciding how to organize a large, usually diverse, area of technology into an appropriate format. Since each technical area has its own unique characteristics and its own team composition, this process varies from one TCP to another. The initial organization of a TCP can often be agonizing to the extreme. Eventually, based on inputs of and discussions with the contributing Military Service/Defense Agency team, a first version of the TCP itself is compiled. This first version is either prepared by a staff member of the Office of the Deputy Director for Research and Advanced Technology or by a selected panel of team members. Draft versions are circulated to appropriate offices in the Services and Defense Agencies for comment and, after several refining iterations, a final version is drafted. Formal Military Service coordination of the final version is the last step in the TCP process.

TCPs produced to date provide objective overviews of long-term requirements in each technical area covered, and describe how various technical programs fit together to fulfill these requirements. However, TCPs are more than mere summaries of the different programs in progress. They also analyze and identify relative priorities, specific recommendations for action (budgetary or otherwise) which will improve the technical area, opportunities for new initiatives, areas of needless duplication or overemphasis, and potential areas for multi-Service funding. The TCP affords DOD technical experts and knowledgeable managers in a technology field a specific opportunity to present recommendations and suggestions on how to strengthen their area. Not all of the recomendations may be suitable for implementation by the Services for a variety of reasons. Nevertheless, these recommendations are an extremely important part of

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the TCP process. At the very least, TCPs provide options to decision makers which could be made known to them in almost no other way.

Stimulate Cooperative Programs

The TCP is no panacea for all technical management problems. The TCP can in no way replace the interactive methods used by the Office of the Director, Defense Research and Engineering, and the Military Departments in the past to coordinate the technology base. Experience has already shown, however, that the TCP process greatly improves communication in a technology area among the Military Services, and is an effective mechanism for spotting duplicative, underfunded, or missing programs. The TCP serves as one of the sources of guidance to the Services in formulating their technology base programs. Above all, it is a systematic way to think through the consequences of alternate decisions in a given technology area and, thus, provides a rational answer to the emphasis and priorities assigned to constituent parts of the program.

While TCPs should facilitate cooperative research and development programs when mutually advantageous, there is no intent to force multi-Service developments which are counter to individual Service desires. This concept appears to work very well. For example, as a direct result of the first TCP completed (Missile and Space Vehicle Propulsion Technology), the Services, at their own instigation, instituted cooperative efforts and joint funding on six tasks with budgets totaling several million dollars. Additionally, the individual Services submitted and implemented $5 million worth of new initiatives, the inspiration and motivation for which can be traced directly to this TCP and the efforts which went into its preparation.

Aid to Technology Management

The TCP is considered a living, interactive sort of document. With periodic revision to keep pace with the rate at which the technology is evolving, the TCP will play a key role in overall DOD planning for the technology base. It is emphasized that the TCP is a fully coordinated document, mutually agreed upon by the Military Services and the Director of Defense Research and Engineering. It is not a directive by fiat—it is not an order—and, above all, it is not a decision paper. It is rather a new and needed tool for decision making in an area where the decision-making process is particularly difficult.

At the present, TCPs have been completed or are in the final stages for 11 different science and technology areas. Among them are TCPs on:

- Aeronautical Vehicle Technology.
- Aircraft Propulsion Technology.
- Behavioral Science.
- Biomedical Science.
- Electron Devices.
- Environmental Sciences.
- Materials.
- Missile and Space Vehicle Propulsion Technology.
- Structures Technology.

In preparing the first TCPs, the effort has been concentrated on the exploratory development activities of the Military Services. About 70 percent of such activity is now contained in current TCPs. As updated versions of these same TCPs are prepared, additional research and non-systems activity will be brought in. The near-term goal is to cover perhaps $800 to $900 million of the technology base in less than a dozen documents. The non-TCP portion of the technology base would then consist of small discrete areas of work and certain larger self-contained programs under the Defense Agencies. Unless a TCP would improve understanding or aid in management, there would be no reason to include these latter areas under the TCP cover. Stated another way, the preparation of a TCP involves an appreciable investment of personnel resources which must be more than matched by the utility of the product to make the exercise worthwhile. We believe that all the TCPs now planned will amply fulfill this criterion.

As stated previously, TCPs are viewed principally as management tools. They are not to be used as documents for information exchange. As such, they have been treated as internal DOD documents, jointly prepared by and for use by personnel of the Office of the Secretary of Defense, the Military Services, and the Defense Agencies. They have been circulated to certain other interested government departments, however, and it is fully intended that future presentations to the Congress on technology base activities will rest, in part, on these documents.

The implementation of the TCP concept has significantly improved structuring, assessment, and management in the technology base. This should result in improved downstream defense capabilities for the United States.

Defense Documentation Center Maintains Depository of R&D Reports

Robert H. Rea

The Department of Defense cannot afford the luxury of rejecting, ignoring, or otherwise neglecting to utilize the knowledge and information, derived or developed in completed efforts, that can be applied to current Defense-sponsored research and development projects.

There is a vast invaluable collection of scientific and technical reports, generated or sponsored by the Department of Defense, available from the Defense Documentation Center (DDC) for use in the DOD-industry partnership. Information in these reports can enhance the efforts of the aerodynamicist, chemist, mechanical engineer, psychologist, ecologist, or any other member of the Federal research and development community.

A major field activity of the Defense Supply Agency, DDC makes available from one central depository thousands of research and development reports produced each year by U.S. military organizations and their contractors. Although originally created to serve the military, DDC has extended its services to all Federal government agencies and to their contractors, subcontractors and grantees.

In addition, DDC operates computer-based data banks of management and technical information concerning current research and development projects and is responsible for developing improved information and retrieval systems. These services are available to eligible organizations registered with DDC.

Registration for DDC services also assists the user in obtaining access to the services offered by DOD-sponsored Information Analysis Centers and by major DOD technical libraries.

The center maintains a central authority file of users eligible for access to DOD scientific and technical information. The levels of clearance for classified information and the "need-to-know" categories by subject areas are maintained in this field. A Dissemination Authority List is issued monthly by DDC so disseminating activities can verify the eligibility of requesting organizations.

Registering for Service

DDC services are restricted to those requesters who are registered with DDC. The principal form used in registering is DD Form 1540, "Registration for Scientific and Technical Information Services."

Contractors, subcontractors and grantees must submit a separate DD Form 1540 for each contract or grant. Registration varies according to whether or not classified materials and services are required. A facility security clearance must be on record at DDC before classified information will be released to an applicant.

If the organization's facility security clearance is not on record at DDC, two copies of DD Form 1541, "Facility Clearance Register," must be completed. The requester sends these forms to his particular defense contract administration services region, whose office of industrial security will inspect the requester's facility to see if ample protection will be provided the classified documents.[1] If approved, the DD Form 1541 is forwarded to DDC and the facility is registered to receive the classified service.

Applicants from the Military Services and DOD Agencies send registration forms to DDC through their commanding officers, technical directors, or authorized designees.

Upon registration, an organization is sent a service package containing procedures for requesting copies of technical reports and other DDC services. The user code number assigned the organization will have been entered on a copy of the approved DD Form 1540. To request a document from DDC, a scientist or engineer need only record the control number of the document; the contract or grant number under which he is requesting service (if non-government user); the date of the request; the type of copy desired, *e.g.*, full-size, microfilm, or microfiche; and enclose prepayment for applicable service charge.

DDC's microfiche are in accordance with Federal Microfiche Standards. The size of the film is 105mm by

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[1] *Security procedures for handling classified DOD information by contractors, subcontractors, grantees and potential contractors are specified in the DOD Industrial Security Manual for Safeguarding Classified Information (DOD 5220.22–N) sold for $2.25 by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.*

148mm (approximately 4 by 6 inches). The present 20-to-1 reduction format permits up to 58 pages of microimages to be stored on the first sheet and up to 70 microimages on each succeeding sheet. In early 1972, the center will begin producing microfiche 24-to-1 reduction according to National Microfilm Association standard. This format permits up to 96 microimages on each sheet. The new format increases the probability of placing an entire report on one sheet of microfiche.

DDC's authority to release reports is based on the report's security classification, any limitations imposed by the source of the report, and the requester's need-to-know. Release limitations are imposed (by sources) to protect patentable matter or proprietary rights, or to withhold information on the relative merits of commercial products.

Technical reports received at DDC, having no security or other distribution restrictions, are sent to the National Technical Information Service (NTIS) of the Department of Commerce. NTIS sells full-size or microfiche copies of DDC reports to the general public, including industry. Thousands of these reports are made available to industry each year.

Pricing Policy Is Controlled by NTIS.

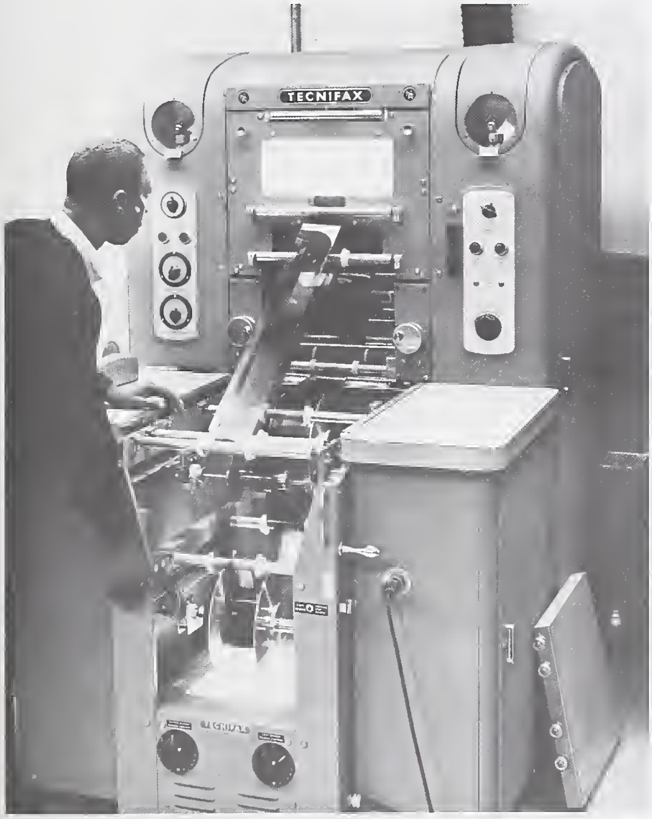
In addition to distributing unclassified reports and documents, NTIS also acts as DDC's fiscal agent. Registered DDC users generally send their requests to the NTIS, 5285 Port Royal Rd., Springfield, Va. 22151. NTIS processes the order through DDC.

There is a $3 service charge for each full-size copy (95¢ per document in microform) of reports shipped from DDC. Prepayment is required by check or money order, prepaid document coupons, or by NTIS deposit accounts. User organizations having NTIS deposit accounts may order reports by telephone, electrical transmission, or DDC Form 1 directly from DDC.

A NTIS deposit account can be established with an initial deposit of $25 or an amount equal to the initial order, whichever is larger. Charges for documents and services are automatically debited against the account through the use of pre-addressed deposit account order forms.

Prepaid coupons can be purchased from NTIS in three different denominations. Full-size copy coupons, having a face value of $1, can be purchased in books of 25 coupons for $25 and those having a face value of $3 can be purchased in books of 10 coupons for $30. Prepaid microfiche copy coupons of 95¢ value are available in books of 25 coupons for $23.75.

Research and development organizations without current contracts or grants may be declared eligible for documentation services by a Military Department under the Potential De-



Microfiche copies of technical reports being duplicated at Defense Documentation Center.

Technical reports accessioned by Defense Documentation Center being processed into microfiche copies.

fense Contractors Program. These programs and points of initial contact are shown in Figure 1.

Potential Defense Contractors Program

Points of Initial Contact

Army Qualitative Requirements Information Program (QRI)
Frankford Arsenal
Attn: SMUFA—U–1000 Bldg. 107–B
Bridge & Tacony Streets
Philadelphia, Pa. 19137
Telephone: (215) JE 5–2900, Ext. 2567

Navy/Industry Cooperative Research and Development Program (NICRAD)
Naval Material Command
Attn: MAT 03P2
Washington, D.C. 20360
Telephone: (202) 692–1113

Air Force Technical Objectives Document Release Program (TOD)
Air Force Systems Command
Attn: DLLT
Andrews Air Force Base
Washington, D.C. 20331
Telephone: (301) 981–4634

ARPA Potential Contractors Program (ARPA/PC)
Advanced Research Projects Agency
Attn: TIO
1400 Wilson Blvd.
Arlington, Va. 22209
Telephone: (202) 694–5919

Figure 1.

Report Collection Grows

DDC's technical report collection has increased to over a million titles. Those accessioned since March 1953, approximately 670,000, are under computer control for quick retrieval. Almost all areas of science and technology are included in the collection. For example, there are more than 65,000 titles in electronics and electrical engineering and 90,000 concerning physics. The collection, which spans three decades, is the finest source of information on military/industrial technology.

The collection continues to grow because DOD directives require Defense organizations and their contractors to submit to DDC copies of any scientific or technical report of defense efforts in research and development (up to and including secret and restricted data).

Documents are screened at DDC to ensure they are of scientific and technical nature and to make certain they do not duplicate reports already in the collection. Upon selection, each report is assigned a control (Accession Document or AD) number, processed into the collection, and recorded by microphotography.

DDC announces the existence and availability of documents through its own announcement publication and through the announcement media of the Department of Commerce.

For announcement and registration purposes, DDC categorizes technical reports into a two-level arrangement consisting of 22 major subject fields and a further subdivision of these fields into 188 subject groups. The 22 broad subject fields are:

- Aeronautics
- Agriculture
- Astronomy and Astrophysics
- Atmospheric Sciences
- Behavioral and Social Sciences.
- Biological and Medical Sciences.
- Chemistry
- Earth Sciences and Oceanography
- Electronics and Electrical Engineering
- Energy Conversion (Non-propulsive)
- Materials
- Mathematical Sciences
- Mechanical, Industrial, Civil and Marine Engineering
- Methods and Equipment
- Military Sciences
- Missile Technology
- Navigation, Communications, Detection and Countermeasures
- Nuclear Science and Technology
- Ordnance
- Physics
- Propulsion and Fuels
- Space Technology

All classified reports and those unclassified reports having distribution limitations are announced in the confidential DDC *Technical Abstract Bulletin* (TAB). Unclassified DOD reports without distribution limitations and similar technical reports from other Federal agencies are announced in *Government Reports Announcements* (GRA), published by NTIS (cost: $30 per year). Both the TAB and the GRA are published twice a month.

Index volumes are available with each issue of these announcement publications. Each of these references includes a Corporate Author-Monitoring Agency Index, Subject Index, Personal Author Index, Contract Number Index and a Report Number Index.

In addition, the indexes of TAB include a Release Authority Index and a Title Index. The indexes are cumulated quarterly and annually. TAB annual indexes are available in full-size or microfiche.

Bibliography Service

As a related function within the technical report program, DDC provides a bibliography service to registered user organizations. Through this service, the center produces lists of technical reports in the collection relating to particular subject areas.

Bibliographies at DDC take three separate forms. The report bibliography is prepared in response to a specific request for references to technical reports related to a particular subject area. With specific descriptive information, the center prepares a computer search strategy to locate information concerning documents most pertinent to the requester's needs. The resulting bibliography is sent as a bound document, each page containing a separate report description.

The scheduled bibliography, the second type, is prepared for those subject areas for which numerous requests for bibliographies are anticipated. Such bibliographies are added to the DDC collection, complete with AD number, and announced and requested in the same manner as other technical reports.

User organizations having access to Telex communications equipment may request rapid response bibliographies, the third type. The response to such requests is a listing of AD control numbers of technical reports pertinent to the requester's interests. In order to use this bibliography, the requester must have access to a file of TAB, the documents themselves, or DDC's compendiums of filmed report citations.

In addition to the current listings, DDC is now selling "Defense Research and Development of the 1960s" to its registered users. It is a 10-year compendium of descriptions of the 400,119 technical reports announced by DDC during the decade. The data package, available on 16mm microfilm or magnetic tape, contains four five-year sections covering classified and limited distribution reports, and unclassified and unlimited technical reports. Also available is a similar one-year compilation of 1970 announcements.

Management Information

While DDC is a major source of documents on completed research and development, it is also a central source of management and status information on DOD research and development in progress. The center's major effort is the Research and Technology Work Unit Information System. It is designed to provide scientists, engineers and managers in the Federal research and development community with automated means to determine quickly who is doing what research, when, where and how. The system may be used to identify and avoid undesirable duplication of effort. If a review identifies actual or potential duplication, one project could be terminated or both could be continued with close coordination for more comprehensive results.

Twenty-five data fields are used to describe each work unit, which can be defined as the smallest segment into which a project is divided for control purposes. At the end of FY 1971, there were more than 18,000 active DOD work unit records in the system. The information is computer-stored in the DDC data bank to permit retrieval of the data elements in a wide variety of logical combinations.

Scientists and engineers may use this system to determine the approach and current status of technical efforts related to their own tasks, identify scientists and engineers working in areas of smilar technical interests, and to keep abreast of the progress statements in pertinent work units.

Data from the system are available in a variety of formats to DOD components and other Federal agencies. For instance, they may request information in the forms of statistical summaries, tabulations, and complete or partial printouts of selected resumes. Contractors and grantees of Federal agencies have limited access to the data bank through the use of a single, fixed format.

Additional DDC Services

DDC supplements its technical information program with various other services. One of these, the Automatic Document Distribution (ADD) Program furnishes DDC users microfiche copies of classified and limited documents in selected subject areas automatically. Anticipating a user's needs, ADD matches the user's subject-interest "profile" against the data bank of newly accessioned documents.

The objective is to supply the selected microfiche copies of documents to ADD registrants at the same time as the documents are announced in TAB. Users must pay 35¢ for each report and must possess a deposit account with the NTIS in order to participate in the ADD program.

Another service offered by DDC is Automatic Magnetic Tape Dissemination (AMTD), which provides its subscribers with magnetic tapes containing the full TAB text.

When requesters require information exceeding that available from the center, DDC's referral service is used to direct them to organizations or to individuals known as potential sources of expertise, or to the National Referral Center for Science and Technology.

Development Program

DDC is constantly looking toward the future. The center is designing and developing new systems and improving existing systems to make scientific and technical information more accessible, available, and selective at reduced costs.

DDC is experimenting with such techniques and equipment as:

(please turn to page 40, col 3)

Robert H. Rea has served with the Defense Documentation Center since 1961 and is presently assigned as a liaison officer in the Office of Customer Relations. In previous assignments, he served as the editor of the *Technical Abstract Bulletin* and as a subject analyst. Mr. Rea holds a bachelors degree from Pennsylvania State University and a masters degree from American University.

Status of ASPR Committee Cases

The following is a listing (revised as of Sept. 29, 1971) of the cases currently under consideration by the Armed Services Procurement Regulation (ASPR) Committee, of the Office of the Assistant Secretary of Defense (Installations and Logistics).

On items marked by asterisks, the text has been omitted to shorten the listing. The asterisks denote actions taken as shown below:

*—Case closed, no ASPR revisions resulting.

**—Case closed, approved for printing in a subsequent ASPR revision.

***—Case closed, approved for printing subject to further government coordination.

The listing includes subjects of interest to contractors but excludes cases of a minor or editorial nature, those considered "sensitive," and those involving a deviation from the regulation which are processed by the ASPR Committee.

The ASPR Committee meets with representatives of major industry associations periodically to explain the purpose and status of each of the cases under consideration, and to answer questions from industry representatives concerning the cases. All proposed ASPR changes of major policy are forwarded to industry associations in draft form for the review and comments of the association memberships. Industry comments are evaluated by the Defense Department before a final decision on the proposal is made by the ASPR Committee.

**ASPR Case No. 68-14—*Revisions to ASPR 15-205, Cost Principles on Bid and Proposal and Independent Research and Development.* Printed in Defense Procurement Circular (DPC) No. 90.

**ASPR Case No. 68-184—*Clauses for Service Contracts.* Being printed in Revision 10.

**ASPR Case No. 68-214—*Proposed ASPR 9-203(f) Clause, Rights in Technical Data—For RDT&E and Acquisition Contracts for Major Systems and Subsystems.* Being printed in Revision 10.

ASPR Case No. 69-24—*ASPR Section IX, Part 2.* To consider the need for changes to Section IX, Part 2, and other pertinent ASPR Sections to conform ASPR to DOD Instruction 5010.12, entitled "Management of Technical Data." Industry and government comments on the latest changes involving the "Deferred Ordering of Technical Data" and the "Technical Data—Withholding of Payment" clauses, have been received and are under study.

***ASPR Case No. 69-76—*Verification of Catalog or Market Price Exceptions Under Public Law 87-653.* Awaiting approval of DD Form 633-7 by the Office of Management and Budget.

***ASPR Case No. 69-22—*Uniform Reporting of Government Property—Revision of ASPR B-311, C-111 and S3-603.* Awaiting approval of DD Form 1662 by the Office of Management and Budget.

ASPR Case No. 67-316—*Single-Service Management of Industrial Facilities.* To develop procedures which will provide that only one contract authorizing use of government facilities will be in effect at any one location. It is intended that contracts which authorize the acquisition or furnishing of government facilities will provide for the automatic transfer of those facilities to the "use" contract upon receipt of installation. This matter is still under consideration.

ASPR Case No. 69-131—*Warranties—Consequential Damages.* Defense Department policy with respect to contractor liability for loss of, or damage to, property of the Government, occurring after final acceptance of supplies delivered to the Government and resulting from any defects or deficiencies in such supplies, was published in DPC No. 86. A report on additional revisions, concerning express and implied provisions and extension of the policy to contracts other than those calling for delivery of supplies, is being submitted to the ASPR Committee for consideration.

ASPR Case No. 68-104—*Late Proposals and Modifications in Negotiated Procurements.* To consider revising ASPR 3-506 covering late proposals and modifications in negotiated procurements in light of the numerous decisions by the General Accounting Office in this area. A policy on this subject has been approved and the ASPR coverage currently is being revised to conform to this policy.

ASPR Case No. 69-161—*Evaluation Criteria.* To undertake the development of additional guidance of evaluation criteria to be included in solicitations, thus giving effect to numerous General Accounting Office decisions that prospective offerors should be advised of the relative importance to be attached to each evaluation factor. This matter is still under study and is being considered as a part of the material being developed under Case 68-104.

**ASPR Case No. 69-173—*Revision of Billing Prices Under Incentive Contracts and Price Redetermination Contracts.* Being printed in Revision 10.

ASPR Case No. 69-197—*Contractor Procurement System Review (CPSR).* To consider expanding existing ASPR coverage on CPSRs and consent to subcontract provisions to provide more detailed guidance. Industry and government agency comments have been received and are currently under study.

ASPR Case No. 70-19—*Wage and Material Price Escalation.* To review existing ASPR escalation provisions to determine the advisability of developing additional wage and material price escalation clauses for use in contracts for complex weapon systems to be produced over an extended period of time. Clauses developed by a Special Study Group established to review this subject were forwarded to industry for comment. Comments have been received and a report on this subject was rejected. The need for ASPR coverage of this matter is currently being reconsidered.

As an adjunct to this case, a report is currently being considered which will clarify the intent of the "Price Escalation" clause in ASPR 7-107. Material developed under this part of the case will be forwarded to government agencies and industry for comment.

ASPR Case No. 70-39—*Allocation of Contractors' Cost for Special Facilities.* To consider additions or revisions to Section XV to clarify cost allocation procedures under ASPR 15-201.4 in general, and allocation of the costs of special facilities, such as wind tunnels, in particular. Material developed under this case was sent to industry and other government agencies for comment. Comments have been received and are currently under study.

ASPR Case No. 70-41—*Capital Data Employed.* To consider the advisability of initiating a policy change to use capital-employed as a factor in developing pre-negotiation profit objectives. This matter has been assigned to a specially selected subcommittee and currently is under study. Worksheets developed to obtain the necessary data to test the concept have been returned by most of the selected contractors participating in the test. The subcommittee currently is analyzing the data received from industry and a special high level group has been convened to review the subcommittee's analysis and establish overall DOD policy. A final decision concerning the approach to be followed in determining profit rates is expected by Dec. 1, 1971.

* ASPR Case No. 68-69—*Proposed Addition—Special Tooling Retention/Storage Agreements.*

ASPR Case No. 70-62—*Proposed Changes to Milk Price Adjustment Clause in ASPR 7-1301.8 and 7-1301.9* To resolve the difficulties being encountered in establishing reasonable prices for milk products under the present ASPR clauses by substituting a cancellation provision. The proposed coverage was submitted to appropriate industry associations and the General Accounting Office for comment. Comments have been received and a test of the procedure submitted to industry has been authorized.

* ASPR Case No. 70-64—*Personnel Management Review Including Executive Compensation.*

ASPR Case No. 70-83—*Rights in Data—Computer Programs.* To consider the desirability of developing a standard ASPR "Special Rights in Data" clause for computer systems analyses and programming services. This matter was assigned to a subcommittee and currently is under study.

**ASPR Case No. 70-90—*Social Security Taxes—Interpretation of ASPR 11-401.1, Tax Clause.* Being printed in Revision 10.

ASPR Case No. 70-103—*Control of Constructive Changes and Other Claims on Nonconstruction Contracts.* To consider the need for clauses in ASPR similar to those in Navy Procurement Circular No. 18 to control the constructive changes problem. The Committee authorized the Navy to continue its test of the clauses in Navy Procurement Circular No. 18 until final action is taken under this case. Other Military Services may use the clauses on a case-by-case basis after Committee concurrence. With regard to a related Army clause, "Preproduction Evaluation," the Committee determined that the Army has the right to use the clause when appropriate. Proposed ASPR coverage is being prepared for submission to other government agencies and industry for comment.

ASPR Case No. 70-108—*Proposed Revision to ASPR Relating to Policy Guidance on Major Weapon System Acquisition.* To consider the impact on ASPR of Deputy Secretary of Defense Packard's policy memorandum of May 28, 1970. This matter was assigned to a subcommittee and currently is under study. The subcommittee's assignment primarily involves Section III, Part 4, "Types of Contracts," and Section IV, Part 1, "Procurement of Research and Development." Interim changes to Section III, Part 4, were published in Revision 9 to temporarily conform the ASPR to the intent of Secretary Packard's memorandum. A continuing effort is being expended to develop more detailed coverage for future publication.

**ASPR Case No. 70-113—*ASPR 15-204, Application of Principles and Procedures in Pricing Fixed-Price Subcontracts.* Being printed in Revision 10.

**ASPR Case No. 70-139—*Proposed Revisions to ASPR 15-205.1, Advertising Costs.* Being printed in Revision 10.

**ASPR Case No. 70-144—*Equitable Adjustments for Destination Changes (ASPR 7-104.75).* Being printed in Revision 10.

**ASPR Case No. 70-163—*ASPR Cost Principles on Patent Costs—15-205.26.* Being printed in Revision 10.

ASPR Case No. 71-3—*File Documentation Requirements.* To develop a proposed "Record of Subcontract Negotiations" clause and a proposed revision to ASPR 3-811 in response to a General Accounting Office (GAO) recommendation. The GAO considers it essential that a clause be developed requiring that records of negotiation be retained in connection with subcontracts and that a requirement for documentation of the factors considered in negotiating incentive fees be established in order to be able to determine the reasonableness of the incentive fee finally paid to contractors. Material developed under this case was forwarded to other government agencies and industry for comment on June 17, 1971. Comments have been received and currently are being analyzed.

ASPR Case No. 71–23—*Proposed Revision to ASPR Relating to Special Tooling and Special Test Equipment (ST&TE).* In response to GAO criticism this case was established to review the current ASPR provisions and to develop improved management procedures of ST&TE. This matter was assigned to a subcommittee and is currently under study.

* ASPR Case No. 71–27—*Proposed Clarification of Costs Continuing After Termination.*

**ASPR Case No. 71–28—*Procurement Quality Assurance on Shipments Between Contractors, ASSPR 1–201.* Being printed in Revision 10.

ASPR Case No. 71–44—*Shipment by Communist Vessels.* To review ASPR 1–1410 and 7–104.19(d) to determine if their provisions conflict with current policy regarding the use of communist country ships in transporting material to be used in the performance of DOD contracts. This matter currently is under study.

ASPR Case No. 71–46—*Training and Education Costs.* To consider a revision to ASPR 15–205.44 to allow certain currently unallowable costs for both full- and part-time degree oriented or postgraduate education. Material developed under this case was forwarded to other government agencies and industry for comment on Aug. 2, 1971.

ASPR Case No. 71–59—*Office of Management and Budget (OMB) Circular No. A–101.* To consider the implications of OMB Circular A–101 of Jan. 9, 1971, on current ASPR provisions regarding the administration of grants, contracts, and other agreements with educational institutions. The matter currently is under study.

ASPR Case No. 69–90—*Proposed Revision to ASPR 1–706.6(c) and 1–804.2(b)(1).* To restructure the format and clarify the wording of ASPR 1–706.6, 1–803 and 1–804 with regard to partial small business set-asides and labor surplus area set-asides. Other government agencies and industry comments were received on the coverage developed by the Committee. The final version of the coverage currently is being coordinated with the Small Business Administration and other government agencies directly involved.

* ASPR Case No. 70–110—*Cost of Sales Versus Input Cost as Base for G&A.*

***ASPR Case No. 68–218—*Application of Public Law 87–653 to Final Pricing Actions.* Awaiting OMB approval of DD Form 633–6.

ASPR Case No. 71–65—*ASPR 4–110, Cash Sharing Policy (OMB Circular A–100).* To consider the effect of OMB Circular A–100 entitled "Cost Sharing on Research Supported by Federal Agencies" on the cost sharing policy in ASPR 4–110. A report on this subject is currently being considered.

ASPR Case No. 71–74—*Safety and Health Regulations for Construction.* To implement new safety and health regulations for construction (29 CFR Part 1518, 36 F.R. 734, April 17, 1971, as modified by 36 F.R. 8311 of May 4, 1971, and 36 F.R. 9423 of May 25, 1971) promulgated by the Secretary of Labor. Since the regulations were originally effective on April 24, 1971, the ASPR Committee on April 30, 1971, authorized the individual Departments to issue an interim change to ASPR immediately. It was promulgated by messages. The task of developing a permanent change to ASPR was assigned to a subcommittee. The matter is currently under study and is being coordinated with the Department of Labor.

ASPR Case No. 71–88—*Master Solicitation Technique.* To consider the feasibility of issuing to contractors, who provide general supply type items, a master solicitation document consisting of repetitively used provisions (other than ASPR Section VII clauses). Individual solicitations will then refer to the applicable provision in the master solicitation document rather than including the entire provision. This technique is intended to eliminate the need for a sizeable amount of paperwork. It should benefit both purchasing officers and contractors who handle the papers. Defense Supply Agency centers have been authorized to test the technique. Upon completion of the test, a report is to be submitted to the Committee for further consideration of the matter.

ASPR Case No. 71–92—*Review of DPC No. 81—MILSCAP.* Problems are being encountered by both contractor and DOD personnel in following the intricacies of the numbering systems established by DPC No. 81. The ASPR Committee has appointed a subcommittee to study the problem.

ASPR Case No. 71–101—*Revision of "F.O.B. Destination" Clause, ASPR 7–104.71.* To clarify the intent of the "F.O.B. Destination" clause with regard to vehicle unloading responsibilities and other problems encountered in interpreting the clause. The matter is assigned to a subcommittee and is currently under study.

ASPR Case No. 71–103—*Environmental Protection (Executive Order 11602).* To develop ASPR coverage to implement Executive Order 11602, "Providing for Administration of the Clean Air Act with Respect to Federal Contracts, Grants or Loans." The matter was assigned to a subcommittee to develop the necessary coverage and to coordinate its proposal with the Environmental Protection Agency. The subcommittee report is being submitted to the ASPR Committee.

ASPR Case No. 71–108—*Contractor Documentation for ADPE Acquisition (ASPR 15–205.48(d)).* To eliminate delays in approval/disapproval of contractors' ADPE costs. Information currently required to be submitted by contractors by ASPR 15–205.48(d) generally is inadequate to allow government personnel to approve/disapprove ADPE expenditures, and requires the request for and submission of additional data resulting in unnecessary delay. This matter has been assigned to a subcommittee and currently is under study.

ASPR Case No. 71–113—*Contractor Flight Operations.* This case was established to review the "Ground and Flight Risk" clauses in ASPR 10–404 and 10–504. A subcommittee has been established to improve the content of the clauses and to more definitely express contractors' contractual obligations while operating military aircraft. Proposed changes to Joint Military Regulation AR–95–20, NAVAIR-

INST 3710.1A, AFR 55-22 and DSAR 8210.1 are being considered by the subcommittee for incorporation in the clauses. The matter currently is under study.

ASPR Case No. 71-115—*Indemnification for Unusually Hazardous Risks on Production Contracts.* This case was established to incorporate the provisions of Executive Order 11610, covering the subject matter, into ASPR. A subcommittee was established to develop the necessary ASPR coverage. The subcommittee report is being submitted to the ASPR Committee.

ASPR Case No. 71-122—*Incorporation of Provisions, Notices and Clauses by Reference.* To allow the incorporation by reference of ASPR provisions other than those clauses set forth in Section VII. This recommendation was assigned to a subcommittee and currently is under study.

ASPR Case No. 71-123—*Care of Laboratory Animals.* To consider the effect of Public Law 91-579 "Animal Welfare Act of 1970" on the clause in ASPR 7-303.44. Public Law 91-579 broadens the definition of animals and requires research facilities to show that professional acceptable standards are being followed in respect to the care, treatment and use of animals. A subcommittee report on this subject is scheduled for review by the ASPR Committee.

ASPR Case No. 71-125—*Deferred Costs for Research and Development (ASPR 15-205.35(g)).* The new cost principles for independent research and development and bid and proposal costs disseminated by DPC No. 90 will become effective Jan. 1, 1972. DPC No. 90 does not include provisions for deferred research and development costs similar to those in the current ASPR 15-205.35(g) paragraph. A subcommittee therefore has been established to develop appropriate coverage on a priority basis. It is intended to disseminate these cost principles in a DPC by Nov. 1, 1971, with an effective date of Jan. 1, 1972. The two-month period is considered essential to allow contractor and government personnel time to implement the revised cost principles. Coordination with industry before publication therefore will not be practicable in this case.

ASPR Case No. 71-129—*New Patent Policy.* To consider the effect of the Aug. 23, 1971, Presidential Statement of Government Patent Policy on current ASPR patent coverage. The matter currently is under study and is being coordinated with General Services Administration (GSA) which was assigned overall responsibility for implementation of the new policy by Section 2 of the President's statement.

ASPR Case No. 71-130—*Fair Labor Standards Act and Service Contract Act—Price Adjustment Clause.* To consider the need for rewriting the clause in ASPR 7-107(d) in order to eliminate possible ambiguities in the (c) paragraph of the clause. The matter has been assigned to a subcommittee and currently is under study.

ASPR Case No. 71-133 — *Cost/Schedule Control Systems.* To consider the need for the development of coverage to implement DOD Instruction 7000.2, subject "Performance Measurement for Selected Acquisitions." This matter currently is under study.

ASPR Case No. 71-135—*Implementation of DOD Directive 5000.1.* To determine the changes to ASPR required as a result of DOD Directive 5000.1, "Acquisition of Major Defense Systems." The matter has been assigned to a subcommittee and currently is under study.

**ASPR Case No. 71-137—*Incorporation by Reference of Standard Form 33A, Solicitation Instructions and Conditions.* As a result of DOD's paperwork reduction program a recommendation was made to GSA that SF 33A be incorporated by reference in solicitations. GSA recently informed DOD that it had approved the change. DOD activities have been authorized to adopt this new procedure.

ASPR Case No. 71-147—*Veterans Job Listing Requirements.* To incorporate Department of Labor addition of Part 50-250 to Title 41 of the Code of Federal Regulations (36 F.R. 18398) into ASPR. ASPR requires that contractors inform State employment service systems of all employment openings and file quarterly reports indicating the number of individuals and the number of veterans hired during the period. The regulations include a clause to be inserted in solicitations and contracts. A subcommittee was established to consider this matter and its report is being considered by the ASPR Committee.

Contract Financing

(continued from page 20)

Some have argued that, since the Government has a lower cost of money than the contractor, it is cheaper for the taxpayer if DOD provides a high level of contract financing, rather than reimbursing the contractor for the cost of his additional investment in the work-in-process inventory. It is impossible to prove, however, that the cost of money is any less for DOD than it would be for the contractor. With the Government continuing to provide a substantial portion of the cash needed to finance a contract, the financing reduction is extremely moderate.

There is a positive, if not quantifiable, value to be placed on benefits which will accrue from the new contract financing policy, *e.g.*, a reduction in inequities, the ability to more precisely measure contractor cash investment in work-in-process inventory, and elimination of any tendency to provide funds in an amount greater than appropriate at any phase of the contract.

The new policy on contract financing is an enlightened step forward in the management of funds for government contracts.

Should Cost

(continued from page 23)

the direct manufacturing labor force."[5]

The same GAO report estimated that one defense contractor could have saved the Government $560,000 if he would have used price competition for subcontracted items. This has been pointed out to the contractor and it is estimated that the Government will save $150,000 annually on follow-on contracts for this item.

Future Applications

A should cost study need not only be conducted by the Government. It can also be done by a contractor, by an outside consultant firm, or by a joint industry/government effort. One defense contractor has entered into an agreement with the Army to conduct a joint should cost study on a principal subcontractor for a major weapon system. Hopefully, such joint industry/government studies will solidly convince skeptics of the value of the should cost analysis technique.

The Army Materiel Command is presently evaluating various techniques for applying the should cost approach to research and development procurement. Essentially, such a study would primarily evaluate the adequacy of the contractor's management, performance plans, and cost realism. Initiation of a test application of this concept is expected in the near future.

Summary

The Army feels that the should cost analysis technique is an important part of its four-part program to control cost growth. While the technique is not a panacea for the cost growth problem, it is an important step in improving the Army's ability to better manage its limited procurement dollars. Other DOD agencies are also planning to extensively use the technique on their procurement actions.

Defense contractors are encouraged to consider the value of the should cost concept and use it to test the efficiency of their organizations. By aggressively attacking problem areas delineated in a should cost analysis, a contractor improves his competitive position within the industry. The Government also benefits through reductions in the cost of major weapon systems.

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[5] *Comptroller General of the United States, "Application of 'Should Cost' Concepts in Review of Contractors' Operations," Feb. 26, 1971, pp. 8–9.*

Defense Documentation Center

(continued from page 35)

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Bulletin and Journal Merge
First Issue to be April 1972

The Defense Industry Bulletin and the Defense Management Journal merged effective December 15, 1971. The first issue of the combined periodicals will be published April 1972 as the Defense Management Journal.

This is the final issue of the Defense Industry Bulletin. The Bulletin editorial staff will assume responsibility for the Journal.

Features from both magazines will be retained by the Journal staff which will publish articles of interest to DOD management and industry. The Journal will be made available free of charge to employees of the Department of Defense, its components and to other Federal agencies. It will be available to all others upon subscription from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 at an annual rate of $1.50; single copies will be 40¢. Foreign mailing not including APOs and FPOs, will be 50¢ additional.

Bulletin subscribers will receive the Journal at no additional cost for the current subscription period.

Manuscripts for possible publication may be submitted to the Editor, Defense Management Journal, OASD (I&L), Cameron Station, Alexandria, Va. 22314. Inquiries concerning possible subjects for future issues are welcome and should be sent to the Editor.

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